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INDUSTRIAL WORK FOR GIRLS

A. E. PICKARD
AND
MARIE C. HENEGREN



ELEMENTARY INDUSTRIAL SERIES





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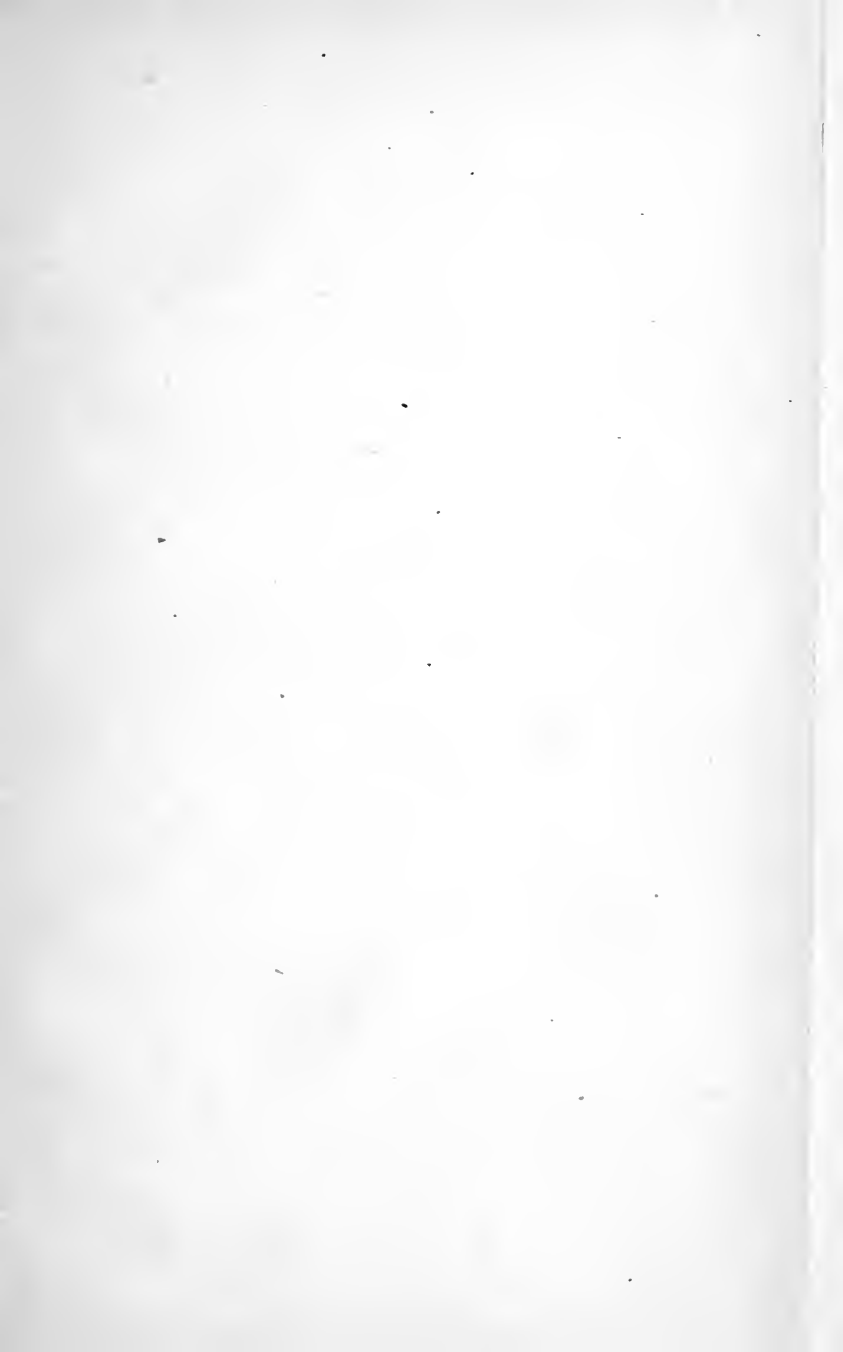
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INDUSTRIAL WORK FOR GIRLS

BY

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ELEMENTARY INDUSTRIAL SERIES

WEBB PUBLISHING COMPANY
ST. PAUL, MINN.

1916

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PREFACE

Until recently the average school has provided very little industrial work for girls. Even yet this important phase of education is confined largely to cooking and sewing, of some of which the educational value is questionable. It is true that the exercises in these subjects can be made very practical. Too often they are unrelated and poorly executed. The work is not *taught*; it is just *done*. In some instances, these conditions have brought criticism upon the entire industrial movement.

The industrial course of study should be as carefully planned from the beginning classes as the academic work and, to be most effective, must be correlated with it; that is, definite instruction must precede or follow the industrial exercise if the student is to get anything more than mechanical training. From this standpoint, the paper weaving, the yarn weaving and the other weaving of the primary classes become important on account of the instruction given in the manufacture of these products and of the information gained about these important industries. The same is true of the clay modeling, basketry and other elementary industrial work. Many of the exercises may have little or no practical value, but they should have much educational value if properly taught. For this reason, a course of study with but a smattering of cooking and sewing in the upper classes, and with no definite plan, is entirely inadequate; the student has no foundation for the work and fails to see the relation between it and her other studies.

Practically all the exercises suggested in this little book have been successfully done in several rural associated schools, as well as in the grades and the teachers' training

department at the central school under the supervision of the authors. Some of the most successful teachers were those who had but little previous preparation for this kind of work but who became interested and learned the exercises with the students.

The teacher must be alive to the situation, as upon her, almost entirely, will depend the success of the work. Reference books and bulletins should be provided. The latter may be obtained free from the Federal and state departments of agriculture, and a few good industrial books should be purchased each year with the library supplies. The amount of time given to industrial work must depend upon local conditions, but some can be correlated with geography and other subjects, as already suggested. Several grades should be grouped together, and the two or three industrial classes should be conducted at the same time, once or twice a week, during the general period. An extended discussion of the industrial course and the management of the classes is given in Pickard's "Rural Education." Teachers who are not familiar with the "Division Plan" of conducting the classes should use that book as a reference.

While parts of Chapter I are extended primarily for the teacher, it is suggested that such parts as pertain to the purpose of industrial work, materials used and other phases that will be helpful should be discussed as class work. These may precede, or be done in connection with, the regular industrial work.

The authors acknowledge the help received in the preparation of this book from standard references on industrial work and from government bulletins. Thanks are also extended to friends who have read parts of the manuscript and offered valuable suggestions.

THE AUTHORS.

October, 1916.

CONTENTS

| Chapter | Page |
|--|------------|
| I Course and Equipment | 9 |
| Purpose of Industrial Work, Preliminary Industrial Work, Second and Third Division Work. | |
| II General Industrial Work | 19 |
| School Exercises in Weaving, Paper Folding and Construction, Raffia and Rattan Work, Modeling. | |
| III Sewing in the Rural School | 33 |
| Equipment, Classification of Stitches, School Exercises, Home Projects. | |
| IV Principles of Home Science | 67 |
| Food Defined, Food Principles, Preservation of Food, Planning Menus, Purpose and Principles of Cooking, Bread Making, Cake Making, Pie Making, Salads, Beverages, Experiments. | |
| V The Hot Lunch | 97 |
| Equipment, General Directions, Sauces and Thickening for Cream Soups, Suggestive Dishes, Recipes. | |
| VI Industrial Club Work | 119 |
| Tomato Contest, Home Canning, Bread Baking Contest. | |
| VII Home Credit Exercises | 128 |
| The Flower Garden, House Plants, Bird Study, Bed Making, Preparing a Meal, Laying the Table, Serving Meals, Clearing Dining Table and Washing Dishes, Fly Control, Planning the Home, Ventilation, Savings Banks, Home Accounts, Industrial Exhibit. | |



Industrial Work for Girls

CHAPTER I

COURSE AND EQUIPMENT

Our grandmothers learned the science of cooking and the art of home making from their mothers. In fact, most of their education was obtained at home, as they did not have the advantages of school that we enjoy. Now that young folk spend much of their time in school there is not the opportunity to learn as much in the home as formerly. For other reasons, also, it is usually impossible for girls to get in the home the training that will make them efficient and businesslike housekeepers.

It has been found possible to have the school co-operate with the home in this training. Many successful projects have been carried out in this manner in various parts of the country during the last few years. Much of the work can be done at school as regular class exercises. Some of it can be better done at home as individual projects for which the school should give "home credit." The contest work with tomatoes, canning, bread baking, etc., is especially valuable and well worth while for any girl. It is not only exceedingly healthful exercise, but it will give a training in managing, marketing and accounting that can hardly be obtained in any other way. Get the girls of your school to organize for some of the home projects and contest work suggested in this book and, if you have never done any of this

work before, you will be delightfully surprised with the results. Many girls have not only earned all the money they needed, but have started savings bank accounts with the proceeds.

PURPOSE OF INDUSTRIAL WORK

Since the purpose of industrial work is to give a broader education by training the hand as well as the head, and to give an opportunity to get familiar with some of the great industries, it is plain that one kind of industrial work, such as sewing, is not enough. It has been observed, also, that students who have done the elementary industrial work of the lower grades are much better qualified for this kind of work in the upper grades. Students who are taking the work for the first time should, therefore, do some work in weaving, both paper and rug, as well as basketry and other work before attempting the work in home economics proper.

A noted educator says this of industrial work: "As far as it neglects industry, the school falls short of its purpose. Industry is among the departments of civilization about which everybody should know something. Social efficiency, too, depends upon knowledge; for without some acquaintance with industrial affairs even those who are engaged in other pursuits are handicapped. They cannot intelligently co-operate with work which they know nothing about."

Industrial training in the elementary schools has been too much of the hit-or-miss kind. There has been no standard course of study to follow, and resourceful teachers have been able to conduct the work only on account of their own training and interest in it. Only two extremes could be expected under such circumstances—talking about industrial work without doing it, and making unrelated articles without instruction.

The time given to industrial work must depend upon local circumstances. At least two hours a week should be devoted to it, and more if possible. The school should be divided into either two or three divisions for this work. The "Division Plan," discussed at length in "Rural Education," divides the usual eight grades into the First Division, the Second Division, and the Third Division. The First Division includes the first three grades; the Second Division includes grades four to six inclusive; and the Third Division is made up of the seventh and eighth grades. Probably a better plan is to have but seven grades in the rural school curriculum. In that event, the Second Division will include only the fourth and fifth grades, and the Third Division, the sixth and seventh.

The supplies needed will naturally depend upon the size of the school and the time given to industrial work. From five to fifteen dollars' worth will be enough for the general industrial work. The industrial and sewing ma-



Figure 1. Preparing and assorting material for industrial work in rural associated schools.

materials of the advanced division should be paid for by the students. A suggestive list of materials with prices is given. They may be purchased from a school supply house.

For the First Division, paper weaving materials are needed. These may be purchased in packages in various sizes, with slits one fourth, one third, and one half inch wide, at about a cent for each mat. All the standard colors may be obtained. Colored sheets should be purchased and strips cut with the scissors for more advanced weaving after the ready-made mats have been put together. Papers for folding and cutting may be purchased at fifteen to twenty cents a hundred squares, usually four by four inches.

Looms may be made or purchased. Hammock looms are easily made by cutting heavy cardboard to the desired size, rounding the ends, and cutting notches in them for the fastening of the warp. These are inexpensive and are just as good as those that are purchased. Looms for rug weaving may easily be made in the school, if the students have manual training. A loom that retails for thirty cents may be made for from three to six cents for the material. Use oak one fourth of an inch thick. Pine or basswood will do. The two endpieces are each ten inches long and one and one fourth inches wide. Place the two endpieces together side to side and make a series of cross notches from end to end by sawing their edges a quarter of an inch deep and a quarter of an inch apart. In these notches the warp is fastened for weaving. The ends are fastened apart with two sidepieces twelve inches long and three quarters of an inch wide. These are fastened by sawing a slit in the ends of the endpieces, so that the sidepieces will just fit flatwise. They are then nailed and glued. Holes are bored in the ends for the heavy wire to make the loom adjustable in width. These wires

are copper, three sixteenths of an inch in diameter, and may be bought at any hardware store. They should be cut fourteen inches long and have a loop made in one end for a handle. A wooden crosspiece similar to one of the ends may be made to slide along the sidepieces. This will enable one to make the loom adjustable in length as well as in width. Flat wooden needles made from quarter-inch basswood, rounded off at one end, and a hole bored in the other for threading the material, can be made very easily, and they are better than the metal needles for the most of the weaving. These should be sandpapered down until they are a little less than one eighth of an inch thick, a half inch wide and about ten inches long. With such a needle, the material may be drawn through the entire width of the rug at one time. Metal needles are needed for finishing the rugs and for working patterns. See Figure 7.

Rug materials are few or numerous as one desires. Colored rags from home are as good as anything for the practice work and cost nothing. They should be cut or torn into suitable lengths and widths. Roving is a very coarse weaving material, excellent for beginners, and may be purchased in colors at about seventy cents a pound. It should precede the finer materials. Carpet yarn may be obtained at about sixty cents a pound. Jute makes cheaper weaving material at from twenty-five to thirty cents a pound. Chenille, plain and mottled, is good for pattern work or for the entire rug. It costs about sixty cents a pound. Macrame cord comes in balls, any color, and costs about fifteen cents a ball. It is used principally for hammock making, but is rather expensive. For practice, rugs may be made out of rags, raffia, or even corn husks, and save the expensive materials for exhibit work. All these ma-

terials are used for the woof of rugs and hammocks. For the warp to "thread" the looms, carpet warp may be purchased in colors at about fifty cents a pound. Brass rings for hammocks will cost about two cents a pair for the inch size. Smaller ones may be used, if desired. Germantown yarn is beautiful for knitting caps, bonnets, mittens, leggings, etc., but is rather expensive for rugs. It costs about fifteen cents a skein.

Basketry and raffia supplies may be furnished by the school or purchased by the students, as desired. Plain raffia costs from fifteen to eighteen cents a pound, and colored, from forty to fifty cents. Rattan, or round reeds, will cost from thirty-five to eighty-five cents, depending upon the size. The medium sizes are used most, but the teacher should order by sending samples of the sizes desired. Flat reed for napkin rings and basketry costs about fifty cents a pound. Raffia and rattan may be dyed, if desired; but it is rather hard to get uniform tints unless one has had practice. The finished baskets and trays should be shellacked as soon as they are made.

Clay for modeling comes in three forms—the flour, in bricks, and moist in barrels. The flour may be obtained in five-pound boxes at five cents a pound. The bricks are usually five pounds each and cost the same as the flour. Moist clay is a little cheaper when purchased in barrel lots. Some communities have near at hand clay that is good for this work, and costs only the labor of getting it.

PRELIMINARY INDUSTRIAL WORK

Those pupils who have not had the industrial work of the lower grades should learn the principles of weaving some raffia and rattan work, and do a little modeling with clay. A few simple exercises are given, the material for

which should be furnished by the school. The students should make the looms, using paper for the Germantown yarn and hammock work, and wood for the rugs. Have a brush and shellac for the baskets and trays.

Paper folding and construction may precede or follow the paper weaving. A ruler, pencil, pair of scissors and paste are needed. Make envelopes and boxes for seed and other collections in agriculture. Other objects from which a selection may be made are as follows: Small basket, doll's furniture, sled, Indian canoe, Puritan cradle, shaving ball or pad, needlebook, match scratcher, Christmas bells, windmill, May basket, carriage, house, barn, chicken-coop, picture-frame, bookmark, fan, Chinese lantern, circular marker, hexagonal box, blotting-pad, calendar, valentine, button box, tent, card and photograph holders, screen, flower holder, whisk-broom holder and pocket comb holder. The materials for these are common manila drawing paper, oak tag, cover paper and colored construction papers.

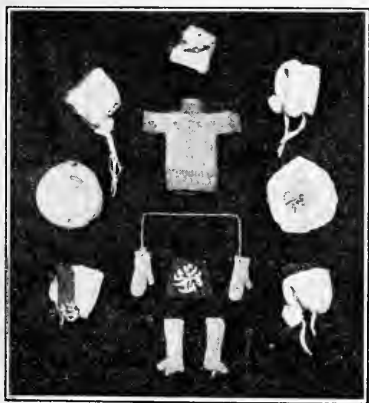


Figure 2. Germantown yarn work, showing caps, sweaters and leggings.

Weaving is usually begun with paper strips and readymade mats, as given under materials for industrial work. Paper weaving may be followed by basket weaving with heavy folding paper, and by the weaving of bookmarks, pencil trays, mats, boxes, napkin rings, match safes, pincushions, blotters, calendars and thermometer backs. After paper weaving, loom work should be

given. Rugs of rags, roving, yarn, jute, chenille, raffia and other materials are made. Bed blankets and draperies for a doll's house may be woven. Hammocks, made of macrame cord on homemade cardboard looms, may be hung outside the doll house. Doll caps, mittens, and leggings may be made of Germantown yarn on the loom and sewed to shape. See Figure 2.

Raffia and rattan work should largely be done in the intermediate and advanced divisions. Raffia rugs, napkin



Figure 3. Making rattan trays and baskets on the school grounds.

rings, picture frames of cardboard wound in raffia, and raffia baskets may be attempted in the primary division.

Modeling is always of interest and its educational value is evident. A piece of oilcloth or a square board should protect the desk. When clay is used it should be prepared the day before. The children, of course, must be able to wash their hands after the work. Encourage outside work and ask the children to bring their products to school to show the others. Modeling is especially valuable in training both hands at the same time. Begin with forms from life, as animals and plants, rather than with geometrical

forms. Later the latter should be given, and the ball, apple, peach, pear, orange, banana and other similar objects modeled. A bird's nest and eggs, marbles, clay baskets, beads and ornamental vases are some of the popular pieces. It is well to have in mind the following general divisions of the subject: 1. Modeling from objects present at the time. 2. Modeling from memory. 3. Modeling from imagination. 4. Design in modeling. Fruit modeling may be shaded with water colors and, when dry, given a coat of shellac which gives a very natural effect, if well done. Other objects may be colored in a similar manner.

SECOND AND THIRD DIVISION WORK

The general industrial work of these divisions should be raffia and rattan weaving, basketry and, if desired, bead-work. The objects made may be varied. If sewing is given in these divisions, there will not be much time left. A little basketry, however, should be given sometime during the course. Napkin rings of rattan and flat reed, baskets of raffia and rattan, collar boxes of rattan wound and fastened with raffia, serving trays of rattan with a wooden bottom, and waste baskets of heavy rattan, are all useful and practical lessons. The rattan work should be given a coat of shellac as soon as finished. It may be finished in colors or natural.

Reference books are necessary for the best results in industrial work. It is impossible to give directions for making of many of the articles suggested here, as space will not permit. The authors have found the following list of books almost indispensable: Paper Sloyd for Primary Grades, by Rich; Industrial Work for Public Schools, by Holton and Rollins; Hand-Loom Weaving by Todd; Card-board Construction, by Trybom; Hand Work, by Hoxie;

Raffia and Reed Weaving, by Knapp; Clay Modeling, by Holland; and How to Make Baskets, by White. Bulletins on industrial work may be obtained free from many of the agricultural colleges.

Industrial work and geography should be correlated to the extent that the students should know where all the materials used come from and how they are used in the industries. Raffia is a light yellow material that is shredded off from the bark of a certain palm tree. Most of ours comes from the island of Madagascar. On account of its pliability and toughness, raffia is much used for industrial work and also for rope making in the industries. Rattan is a kind of a palm that grows in the East Indies. It is peculiar in that it sometimes reaches one thousand feet in length, and is supported by neighboring trees. It grows in various sizes, but is seldom more than an inch in diameter. There are very few branches, sometimes none for two or three hundred feet. The different species are very useful in their native countries for plaited work, rope making, etc. Rattan is twisted into ropes and used for purposes requiring great strength. In this country it is used for basketry, rustic furniture making, etc. Jute is made from the inner bark of a tall annual plant native to the East Indies, but now grown in several countries for commercial purposes. The fiber is used for making carpet, canvas and rope.

Directions for making a few forms of industrial work are given for those who have no other books, but as many reference books on industrial work as the school can afford should be in the library.

CHAPTER II

GENERAL INDUSTRIAL WORK

Students desiring to do industrial work out of school for "home credit" should consult with the teacher regarding objects to be made. Try to develop originality. The following are school exercises:

1—Single Paper Weaving

Materials: Manila drawing paper for practice. Later, use colored papers for a variety.

Directions: Use a square of any desired size from four to eight inches. Fold the bottom over to the top. With

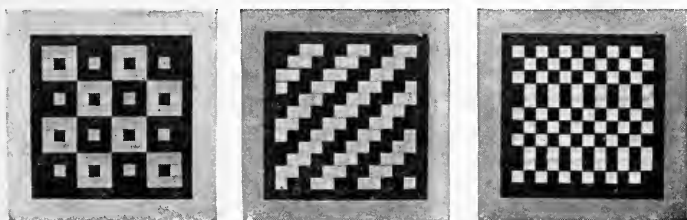


Figure 4. Paper weaving. Note different designs.

a ruler and pencil make lines one half inch apart, beginning one inch from the left side and ending one inch from the right side. The lines should run to the folded edge of the paper, but end just one inch from the upper edge. With the scissors cut along the lines. Open the paper. It will then be cut into slits one half inch apart. Cut another piece of paper into strips one half inch wide and as long as the square just used. Weave the first strip over one and under the next strip in the square. Weave the second strip

in the same way except that you weave under where you wove over in the first strip. Continue until all the strips are woven. Other weaving may be done, using strips of any desired width and color, and working out various designs in the square. As stated elsewhere, these squares may be purchased all ready for weaving, if desired; but it is cheaper to make them, and the practice in ruling and cutting is also desirable. See Figure 4.

2—Paper Box

Materials: Drawing paper, ruler, pencil, scissors and paste.

Directions: Draw on a piece of paper a square just double the size you want your box to be. Fold over the lower edge on the upper, then the lower edge back on the crease, then the upper edge forward on the crease. Turn the paper half around and do the same. Open. You will now have sixteen squares. With the scissors cut the lower edge of the two top corner squares and the upper edge of the two bottom corner squares. Fold, so that the four middle squares form the bottom of the box. Paste the corner squares on the inside of the box. Another box may be made in the same manner and used as a cover. Heavier paper may be used for boxes to store seeds and other agricultural products.

3—Paper Basket

Materials: Same as for the paper box.

Directions: If a square basket is desired, it may be made the same as the box. Then paste the handle to it, letting the ends extend on the inside of the basket. A better form is an oblong about six by eight inches. Rule and cut a paper this size, being careful to get it exact. Fold it into two-inch squares, as directed for the box. Turn

the paper with the long side up and down. Cut the two sides of the upper middle square. Do the same for the lower middle square. Fold the corner squares over the middle squares and paste. Cut the handle and paste on the inside in the middle of the basket. After practicing with drawing paper, heavier material may be used for more permanent baskets. Two colors may be used, if desired.

4—Paper Table

Materials: Heavy folding paper, scissors and paste.

Directions: Cut a square twice the dimensions desired for the table. Fold it into sixteen squares, as directed in making the box. Cut along the bottom of the two upper corner squares and along the top of the lower corner squares. Fold the ends over the corner squares and paste securely. The bottom of the box just made is the top of the table. Cut out an oblong from each side beginning one half inch from the corners, making it about three inches long, to form the legs.

5—Paper Chair

Materials: Same as for the paper table.

Directions: Cut a square having about three fourths as many inches on a side as you used for the table. Fold this into nine squares, as directed in the first numbers. Cut along the top of the lower corner squares. Cut along both sides of the upper middle square. Fold the upper middle square toward you. This forms the back. Now fold one of the upper corner squares over the other and fold the rest of the squares to form a cube. Paste securely. Strengthen the back by pasting a paper of the same size over it. At the bottom cut out oblongs from each side to form the legs, as directed for the table. The back may be ornamented or left square.

6—Paper Lantern

Materials: Plain or colored folding paper, black paper, scissors and paste.

Directions: Paste half-inch bands of dark or black paper across the top and bottom of a six inch square of colored paper or paper tinted with water colors. Wall paper makes pretty lanterns. Fold the bottom over on the top edge. Cut half inch slits from the crease to the black paper. Form circles with the black edges, making the top and bottom of the lantern. Paste securely. Cut the handle of the same material as the circular strips, making it the same width and six inches long. Paste it to the lantern, and hang where the lantern will show to advantage. A cardboard bottom may be inserted, and a small candle fastened to it.

7—Jack-o'-lantern

Materials: Drawing paper and yellow construction paper, or tinted drawing paper.

Directions: Draw an oval the shape of a pumpkin about three by three and one half inches, leaving a short stem at the top. Cut out. With this, trace another on yellow or tinted paper. Cut this out. Then cut holes for the eyes, nose, and mouth, and paste the colored paper over the other. Black disks of paper may be pasted on the pupils of the eyes, and triangles for the teeth. These may be used for invitations or hung up for decorations.

8—Halloween Fence

Materials: Manila drawing paper and yellow tinted paper.

Directions: Using a piece of drawing paper eight inches long and two and one half inches wide, cut out quarter-inch oblongs three and one half inches long, leaving a quarter of an inch at each end to represent the post. Cut out five of these, leaving four strips of paper for the boards. Do

likewise on the other half of the paper. This will make three posts and four boards between each, with the posts projecting above and below. Paste the fence to a sheet of colored mounting paper. On the top of each post paste a small Jack-o'-lantern, about one and a quarter inches in diameter. See Figure 5.

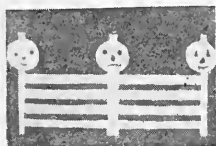


Figure 5. Halloween fence, paper cutting and mounting.

9—Christmas Bell

Materials: Red construction paper about the weight of light oak tag, pencil and scissors.

Directions: On a five-inch square draw or trace a bell, having the widest part at the bottom, the width of the square. A rounded projection in the middle at the bottom represents tongue, or clapper, of the bell. Cut along the outline. A small hole punched in the top of the dome will enable one to hang the bell. It may be used to send an invitation to a school entertainment.

10—Christmas Stocking

Materials: Same as for number seven.

Directions: On a piece of red construction paper draw or trace a stocking about eight inches long and three inches wide at the top, and foot. Cut along the line. This may also be used to send an invitation or to hang up for Christmas decoration.

11—Santa Claus

Materials: Red cardboard, cotton and metal fasteners.

Directions: Trace the upper part of the body down as far as the waist line, making this part about five inches from the top of the head to the waist, and about three inches across at the waist. Cut out. Cut the arms and fasten with a brass fastener, one on each side of the body. Cut out the lower limbs about four inches long and fasten



Figure 6. Santa Claus for Christmas.

on the under side of the waist line. Both the arms and legs will then be movable. Paste cotton on the head for hair and whiskers; on the hands for fur mittens; on the waist line of the coat and above the ankles for the tops of the leggings. This makes an interesting Christmas decoration.

12—Roving or Yarn Rug

Materials: Loom and needle, carpet yarn or string for warp, and rags, yarn, chenille, raffia or roving, for the woof.

Directions: Thread the warp back and forth through the notches at the ends of the loom. See that it is as tight as possible. Weave the woof over one strand of the warp and under the next, across the rug. Return, going under the strand you went over before, and over the next, and so on. If a long wooden needle is used, it may be

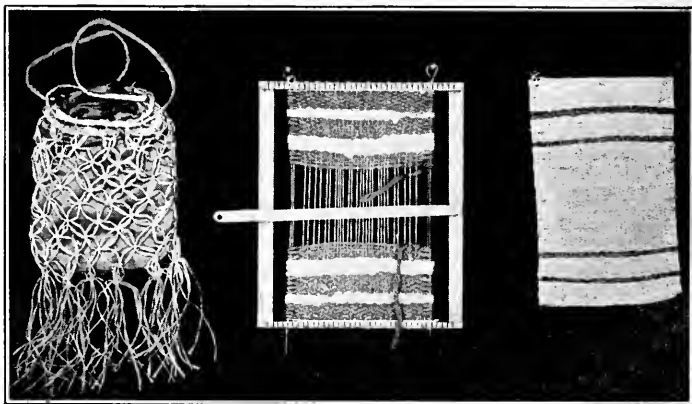


Figure 7. Raffia bag, yarn mat on a homemade loom and a raffia mat.

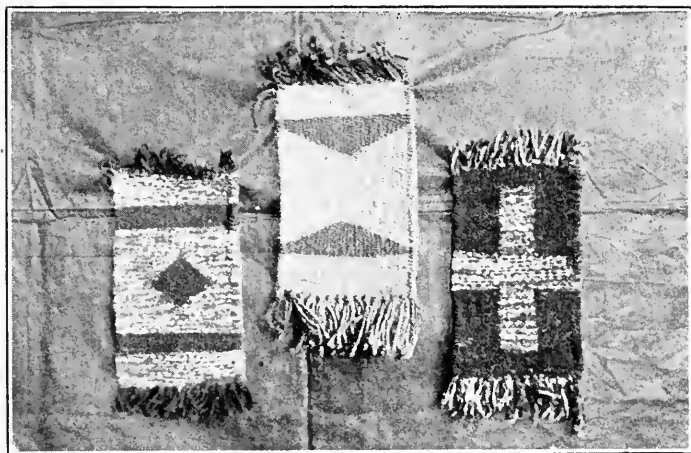


Figure 8. Roving and chenille rugs.

drawn across the entire mat at once, thus saving time. Colored borders and stripes may be used or designs worked in. The loom can be adjusted to any size of material. In a previous paragraph, see directions for making a home-made loom. Keep the woof tight by packing it with the needle and finger. When finished, remove and bind the ends of the warp with carpet yarn, or make a fringe. Raffia may be used instead of roving or yarn. See Figures 7 and 8.

13—Hammock

Materials: Cardboard loom, macrame cord in two colors, a large darning needle and two brass rings about three fourths of an inch in diameter.

Directions: Fasten the warp into the rings which are attached to one side of the loom, and wind it around the ends of the loom over the notches, or through the holes, if those are used instead of notches. Any number of warp

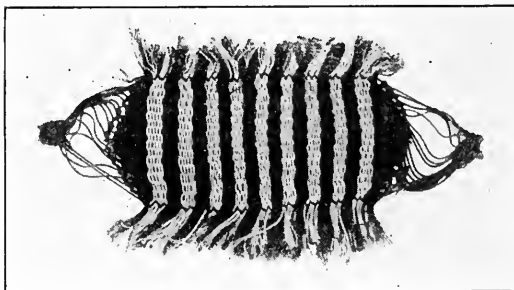


Figure 9. A hammock made of macrame cord.

strands may be used, from sixteen to twenty being common. After the warp is stretched tightly, begin the weaving with the same material used for warp. The woof strands should be about half as long as the distance between the two rings after the hammock is removed. Colored stripes may alternate or borders may be used. When finished, remove from the loom and make a fringe.

14—Reed Napkin Ring

Materials: Wooden loom, number three or four rattan, number one rattan, flat reed and a knife.

Directions: Make a small wooden base of basswood or pine two and one half inches square and a quarter of an inch thick. On this base draw a circle two inches in diameter. With the ruler find the perpendicular diameter, and place a dot at each end of it on the circle. Do the same for the horizontal diameter. Again divide the space between the dots into three equal parts, until you have twelve dots on the circle, the same distance apart. With a brace and bit, or gimlet, bore holes through the base at the dots. These should be a trifle larger than the size of rattan you want to use for the frame of the napkin ring. Cut twelve

pieces of rattan about the size of a match and one and one half inches long. Place these firmly in the holes of the base. Using rattan a size smaller as a weaver, weave four times around the base, going inside of one upright and outside the next. The second time around weave opposite to the first time, and alternate each time. The weaver is moistened so it is tough and pliable. Pull it tight, and press firmly against the base. Next use flat reed for two layers and weave in the same way. Then weave four rounds more of the same size rattan as on the bottom. Fasten the last end securely. Pull the ring off the base, being careful not to leave any of the uprights in it. With number one rattan, bind the edge together firmly by fastening one end around the top of an upright, crossing to the next lower end, twisting around this end, crossing to the next upper end, and so on, until you have gone around the ring twice and finished binding each upright. Cut off the ends of the uprights. Your napkin ring should be strong and somewhat resemble a snare drum on the outside. Be sure to keep the material moist while working. See Figure 10.

15—Raffia Picture Frame

Materials: Cardboard and raffia.

Directions: Cut out a circle from the cardboard. It may be any desired size, but about six inches in diameter is common. Cut another circle in the center, leaving a hole in the middle about two and one half inches in diameter. Select board, smooth raffia. Moisten it, and wind carefully around from center to outside. When finished, sew a braid of raffia around the outer edge, making a loop at the top by means of which to hang it up. Put in the picture. Oval or square shape frames may be made according to the individual preference.

16—Rattan Mat

Materials: Number three rattan for spokes, raffia and number one rattan for weaving.

Directions: For a six-inch mat you will need to use pieces of rattan fourteen inches long in order to make the border and fasten the ends. Cut eight pieces of the number three rattan fourteen inches and one piece eight inches, as it is easier to weave with an odd number of spokes. Take four of the long spokes and cut a slit one half inch long exactly in the middle of each. Draw the other four long spokes half way through these slits, making a cross. Put in the short spoke until the end shows on the other side. With a needle weave raffia over one and under the next spoke, starting in the center, until you have woven a little circular mat about an inch all the way round from the center, or two inches in diameter. You will thus make a firmer middle than you can usually get with the rattan. Now use number

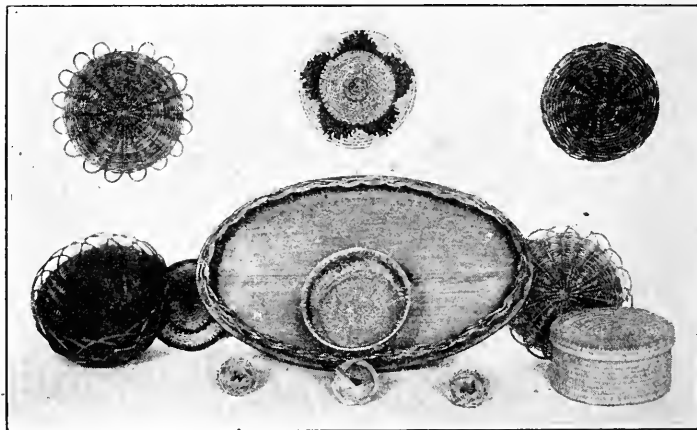


Figure 10. Rattan and raffia work, showing serving tray, baskets, collar box, mats and napkin rings.

one rattan for the weaver in the same way, and keep the seventeen spokes the same distance apart, until you have a mat about six inches in diameter. Now sharpen the ends of the spokes, moisten them so they will bend easily, and pass each one in front of the next spoke to the left, and push it down beside the second spoke, thus making a loop about two inches across and an inch high. Do this with each spoke until the border is finished. While the mat is moist, see that it lies perfectly flat. When dry, put on a coat of clear or colored shellac. See Figure 10.

17—Rattan Basket

Materials: Number four and number two rattan, and plain raffia.

Directions: Cut eight pieces of number four rattan from eighteen to twenty-four inches long, depending upon the height of the basket desired, twenty inches being a good length. Cut one piece an inch or two more than half this length for the odd spoke. Proceed as for the mat in number 16, using the raffia center, until you have a four-inch bottom. Moisten the spokes, and turn each one up as you pass the weaver around it. Keep the weaving pressed down firmly, the spokes the same distance apart, and be very careful in shaping your basket, that it may be even all the way around. When through weaving, fasten the end securely. Make a border with the spokes as for the mat, only pass the spoke to the left in front of two spokes instead of one, and push it down beside the third. This will strengthen the top. Be sure the shape is good. Let dry. Shellac, natural or colored. See Figure 10.

18—Raffia and Rattan Mat

Materials: Number two or three rattan, raffia, needle.

Directions: Moisten the rattan and begin a coil. Take a needle full of raffia. Wind the end of the coil for a short

distance and fasten it together in a ring as small as you can draw it. Continue coiling the rattan, and winding it with raffia. Wind from you. About every third wind, pass the needle between the ring formed and the next coil of rattan, thus fastening the rattan to the ring. The third coil is fastened to the second in the same manner and so on until the mat is completed to any desired size. Colors may be used for as many coils as you wish, making borders. This makes a soft durable mat.

19—Collar Box

Materials: Same as for number eighteen.

Directions: Make the bottom six inches in diameter, the same as the mat was made. Then turn the coils up to form the circular side of the box. If two pieces of number two or three rattan are wound together instead of one piece, the effect is more pleasing, and you will have a firmer box. Continue the coils until the box is three inches deep. Now make a cover in the same manner as the bottom was made, turning the edges up half an inch, so they will fit down over the box, when inverted for the cover. This may be fastened on, if desired. See Figure 10.

20—Wastebasket

Materials: A circular base of one half an inch of pine or basswood nine inches in diameter, heavy rattan for spokes, number seven or eight, and rattan about two sizes smaller for weaving.

Directions: Drill a row of twenty-five holes one half an inch from the edge of the wooden base. Cut twenty-five spokes of heavy rattan about two feet long, and put them through the holes so that they extend about three fourths of an inch below. Using rattan about two sizes smaller as a weaver, turn the bottom side up, and weave



Figure 11. Rattan wastebaskets.

six or eight rows around the spokes, as in basket weaving. Then fasten the ends of the spokes securely, making a close border. Now turn the bottom over, and press the board down firmly on the rattan base. Begin to weave

above the board, keeping the twenty-five spokes the same distance apart, and shaping the basket as you proceed. Make to any desired height, usually about a foot, and fasten the top of the spokes as for the mats and baskets. Cut off ends of spokes. Colored rattan will make effective designs. Finish with shellac. See Figure 11.

21—Serving Tray

Materials: Wooden base, pine or basswood and rattan.

Directions: Make a wooden base of half-inch material in an oval about fifteen inches long and ten inches at the widest part. Bore holes for heavy rattan as for the basket. Make the spokes long enough to weave and fasten below and to make the tray about two inches deep with a close border on top. Weave with number five or six rattan and



Figure 12. Clay work, showing fruit and geometrical forms.

use number seven or eight for the spokes. This makes a very firm and useful tray. It should have two coats of shellac for finish, either dark or natural. See Figure 10.

22—Clay Modeling

Materials: Clay, oilcloth, water colors and shellac.

Directions: Prepare the clay the day before it is to be used. Do not have it too wet, just moist enough to work well. Knead until oily. Mould into shape of object being modeled. If fruit, tint with water colors. Let dry. Shellac with natural finish. See Figure 12.

CHAPTER III

SEWING IN THE RURAL SCHOOLS

The equipment needed by each child for sewing is not elaborate: A thimble, needles, thread, emery bag, tape-measure, shears or scissors, one pair of buttonhole scissors, and the material used in the model and garment making. For some of the advanced work a sewing machine would save time, and the students would get the practice, if they could use one. Some rural schools rent a machine for all or part of the school year, as it is needed. Such an arrangement would not be expensive and would be desirable.

A thimble must be used when sewing. Each child should furnish her own and have it fit the middle finger. A thimble made of silver, celluloid or aluminum is better than one of brass, for the latter may cause infection in case of a sore on the finger. The emery bag is filled with powdered emery, and may be purchased for five cents at any store. When the hands become moist and sticky, the needle does not push through the cloth easily, due to the rust formation. In such a case, polish the needle by running it through the emery bag a few times. Scissors are large enough for school use, and may be purchased for twenty-five or thirty cents. Instruments under six inches long are scissors; those six inches or over are shears. These may be brought from home or the school may own enough for two pupils to use one pair. They must always be kept sharp, or they will neither cut easily nor accurately. Do not allow them to drop, as they may be loosened or even broken. Tools poorly cared for will not give good service.

Needles and thread must be used according to the work to be done. Mrs. Blair, in her *Sewing Tablets*, suggests the following:

The size of thread used should be in proportion to the thread of the material: for coarse gingham, about number 70; for fine soft muslin, number 100. It is always best to use a fine needle and thread for hemming, as the stitches show less. The following sizes of needles are commonly used with the corresponding number of thread:

| Needle | Thread |
|--------------------|-----------------------------|
| Number five..... | Silkateen and Coarse Cotton |
| Number seven..... | Fifty |
| Number eight..... | Sixty, eighty |
| Number nine..... | Ninety |
| Number ten..... | One hundred |
| Number eleven..... | One hundred twenty |
| Number twelve..... | One hundred fifty |

The correct length of a needleful of thread is from the tips of the fingers to the shoulder of the extended arm. Do not bite the thread; cut it with the scissors or knife. Thread the needle with the end of the thread cut off from the spool, as this will prevent knotting. Be sure to baste all seams before attempting to sew them. Where the dimensions of the material are given, the first is to be on the length of the goods, and the second on the width.



Figure 13. The sewing room at a central school of an associated district.

Correct position for sewing is very important. The body should be erect, and both feet squarely on the floor. The light should come from the left unless the student is left-handed. Hold work high enough to be comfortable.

CLASSIFICATION OF STITCHES

Work from Right to Left

Basting is used to hold two pieces or two parts of one piece of cloth in the exact relation desired and used as a guide in sewing. The stitches are made over and under the material, working from right to left. If stitches are of uneven length, have long stitches over and short under.

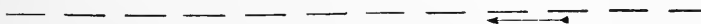


Figure 14. Basting stitch.

Running is light stitching. The stitches are made the same as in basting, but are short and of even length.



Figure 15. Running stitch.

Gathering. For gathering the running stitch is used. When several inches have been gathered on the needle, bring the double thread from the eye of the needle, under the point and then under the eye, making the figure eight, and drawing the thread tight. Continue until material is held securely on the needle. To place the gathers, hold them firmly as they are on the needle, between the thumb and forefinger of the left hand, and with the index finger of the right hand at the back of the gathers, and the thumb on the opposite side of the material, bring out the tiny gathers. Then pull the material straight till the gathers are fixed.

Backstitching is done as follows: Insert the needle and make a stitch under the material twice the desired length; again insert the needle, going back half this distance and



Figure 16. Backstitch.

forward twice the length of the backstitch. The backstitch is used where strength is desired or to resemble machine stitching. The second view shows a row of backstitches as it would be seen if material were removed from the right-hand side of it.

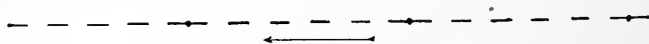


Figure 17. Combination stitch.

The **combination stitch** consists of three or four running stitches and a backstitch. It is used where more strength is required than is obtained with running stitches.

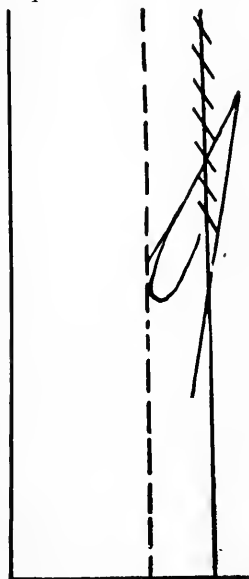


Figure 18. Hemming.

Hemming. When hemming, hold the material over the index finger of the left hand. To fasten the thread, place the end of it about half an inch under the edge of the hem. It will be fastened by hemming over it. Keeping needle parallel with the edge of hem, take one thread of the material and one of the edge of the hem. Make the stitches of the same length and the same distance apart.

Buttonhole stitches are worked close together and used to finish raw edges. See "Buttonholes" for position of needle, position of thread and finished edge.

To overhand two pieces of cloth together, hold the material between the index finger and thumb of the left

hand so that the creased edges are in a horizontal position. The stitch is made by bringing the needle over and then straight through the two edges. Make stitches shallow and close together. Pull the thread tight for each stitch.

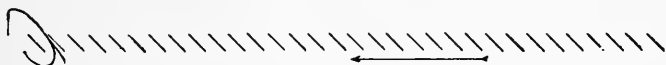
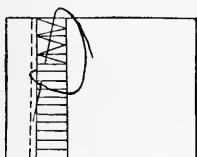


Figure 19. Overhand stitch.

For hemstitching, pull six threads, fewer if the material is coarse, twice the desired width of the hem from the end of the material. Turn the raw edge in one fourth of an inch.



Turn and fold, having the first folded edge even with the last thread. Baste. Hold material and needle as for hemming. Put needle under three or four threads and hold thread as in making chain stitch.

Figure 20. Hemstitch. Draw tight. Make a stitch similar to hemming. The thread is thus brought to the middle of the next group. Hold thread down with left thumb, put needle under next group of threads, and continue as above.

Work from Left to Right

Overcasting is used to keep the raw edges of the cloth from raveling. It is made by bringing the thread over the edge and putting the needle through the material. The stitches are an eighth of an inch in depth and the same distance, or a trifle more, apart.

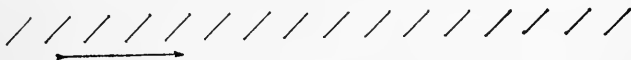


Figure 21. Overcasting.

The **loop stitch** is used to finish the raw edges of flannel or of doilies. See illustration on next page.

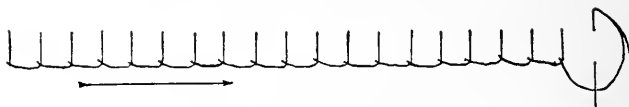


Figure 22. Loop stitch.

Work toward One

The chain stitch is an ornamental stitch. In making it, the thread is held to the left with the thumb to keep it under the needle. Always insert the needle within the last link.

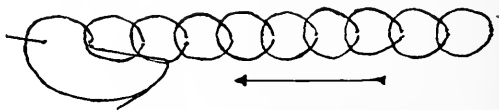


Figure 23. Chain stitch.

The featherstitch is used for ornamentation. When making the stitch to the right, hold the thread to the left; when making the stitch to the left, hold the thread to the right of the general direction of the stem. Clusters of two or three stitches to each side may be made instead of the single one to each side.

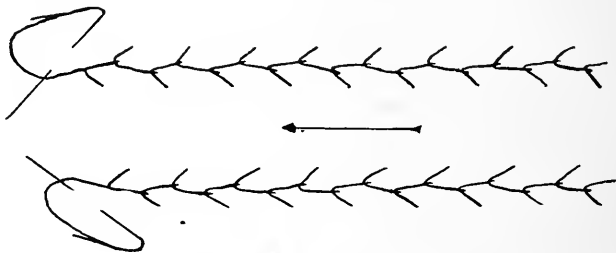


Figure 24. Featherstitch.

Work Away from One

The catstitch, or catch stitch, is an ornamental stitch. It is also used in making flannel seams and hems. The row of catstitch grows in length away from one, but the needle is inserted toward one.

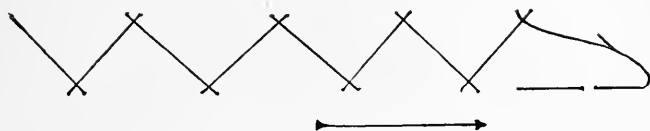


Figure 25. Catstitch.

SECOND DIVISION, ONE YEAR

1—Stitches. (Six Lessons.)

Materials: One piece of one eighth inch checked apron gingham sixteen inches by six inches, number 7 needle and red cotton thread number 50.

Directions: Count down forty-two checks, fold and crease between checks. Knot the thread for basting only, fasten thread with short running stitches and backstitches.

Basting Stitches. 1st row. Down from folded edge two checks, under two checks, over two checks, etc. 2nd row. Down from first row four checks, under one check over three checks. 3rd row. Down from first row four checks, under one check, over one check.

Running Stitches. 4th row. Down from third row four checks. Make two stitches to a check.

Backstitching. 5th row. Down from fourth row four checks, making stitches one eighth inch long, half way across practice piece. The other half, make stitches one sixteenth inch long.

Combination, or running stitches with the backstitch for every needleful. 6th row. Down from fifth row, four checks. Make a needleful of running stitches, then a backstitch, then the running stitches again, and so on.

Chain Stitch. 7th row. Down from sixth row four checks. Make each link one eighth inch long.

Catstitch. 8th row. Down from seventh row three checks. Make stitches across two rows of checks. Start at left-hand edge and work away from you.

Feather, or Brier, Stitch. 9th row. Down from eighth row three checks. Make stitches across two rows of checks. Start at the right-hand edge and work toward you.

Loop Stitch. 10th row. With the lower edge toward you, start at the left and finish edge with loop stitch. Make stitches two checks deep and two checks apart.

2—Needlebook. (Six Lessons.)

Materials: One piece of art canvas five inches by three inches, one piece of flannel five inches by three inches; one tapestry needle number 22 or 23, one crewel needle number 7; silkateen.

Directions: Loop stitch the edges of the canvas cover and the leaves. Sew the cover and leaves together with silkateen and tie the ends into a neat bow. The cover may be ornamented with one of the stitches learned.

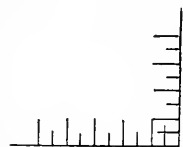


Figure 26. Corner of needlebook cover.



Figure 27. A different arrangement of corner stitches.

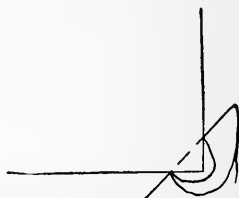


Figure 28. Loop at corner of holder.

3—Holder. (Four Lessons.)

Materials: One piece of outing flannel six inches by twenty-four inches, number 7 crewel needle and silkateen.

Directions: Fold the strip of outing flannel double, having the two ends meet at the middle. Fold again. Baste around the three edges. Loop stitch the four edges, making the four corners alike. See needlebook cover. At one corner make a loop of two or three threads of silkateen, then loop stitch over them. See Figure 28.

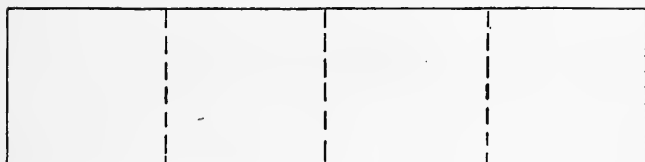


Figure 29. Holder. Fold material on dotted lines.

4—Hemming Dust Cloths, Towels or Dishcloths. (Four Lessons.)

Material: A yard of cheesecloth, for the first; thirty inches of linen toweling or a bleached flour sack—if large size, cut in two—for the second; one third of a yard of linen toweling, or a large sized bleached flour sack cut into four squares for the third.

Directions: Turn one fourth inch hems, baste and fell. To turn the hem, hold the material so that the raw edge is up, turn the edge down about three sixteenths of an inch, starting at the right hand and working toward the left, if right-handed. Turn the material again, making a one fourth inch hem, and covering the raw edge. Hold the material in the same position as when turning the edge. Baste and hem or fell. See Hemming, page 36.

5—Stockinet Darning. (Six Lessons.)

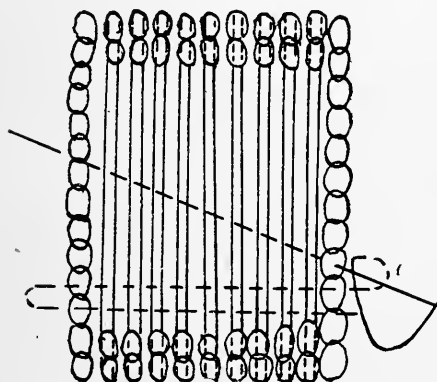


Figure 30. Stockinet prepared for darning.

Materials: Darn woolen hose with yarn the same size as in the stocking, and cotton hose with darning cotton the same size as that in the material. Have the pupils bring their own stockings from home to darn. Use number 7 crewel needle for medium

weight cotton and cashmere hose, number 5 or 6 for heavier weight yarn stockings.

Directions: Cut away worn material, making a rectangular hole. Starting at one corner, make one row of running stitches around the hole about one eighth of an inch from the edge. Draw up the thread, leaving the hole a little larger than natural size. A knot may be avoided by leaving the ends of the cotton rather long. Fill in the warp, allowing two threads for each row of stitches in the stockinet. Care must be taken to leave the threads equally loose. Make running stitches three sixteenths of an inch into the stockinet at each end of the threads. When all the warp threads are supplied, begin filling in the woof by weaving over and under the warp threads. Always put your needle over the threads that the needle went under in the last row. Press the needle down close to the preceding thread to make a close darn and to avoid drawing the woof threads too tight. Make running stitches into the material at the sides the same as at the ends. In a good darn there are raw edges on neither the right nor wrong side, and the edges are smooth and soft.

6—Gingham Sewing Bag. (Eight or Nine Lessons.)

Materials: One piece of one eighth inch checked gingham, twenty-four inches by eight inches; two pieces of tape, each twenty inches long and one fourth of an inch wide.

Directions: Make a one eighth inch hem on each of the two long edges. At each end make a two-inch hem. Fold double, crosswise, right side in. With all edges even, baste through the hems at the edges. Begin overhanding the edges together just below the two-inch hems. Fasten the thread by sewing over three eighths of an inch of the end of it. In overhanding, make the stitches shallow,

close together, and draw the thread quite tight as you make each stitch. Fasten the thread at the end of the seam by making four or five stitches very close together. Remove bastings. Turn right side out, push out corners, and flatten out the overhand seams. Measure down one and one half inches from the top and backstitch or use running stitch, with a backstitch every third or fourth stitch. This makes a one half inch casing for the tape. Start one piece of tape at one edge of the bag and run it all the way around. Put the other piece in, starting at the opposite edge. Tie the two ends of each tape into a very small bowknot.

7—Buttonholes. (Five Lessons.)

Materials: One piece of one eighth inch checked gingham five inches by four and three fourths inches, number 50 thread and number 7 needle.

Directions: At each end and on one side turn edge down one fourth inch. Divide the width into thirds, fold

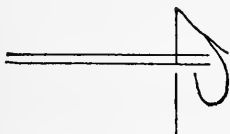


Figure 31. First stitch of buttonhole.

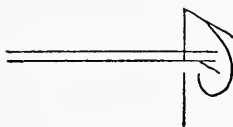


Figure 32. Second stitch of buttonhole.

the raw edge in, and the turned-in edge over. Baste all four sides, keeping edges and corners even. The right-hand portion of a woman's garment buttons over the left. Consequently, the buttonholes should be worked in the right-hand portion. Cut horizontally on the thread of the goods a medium sized buttonhole one fourth inch in from the folded edge. Use buttonhole scissors. Hold practice piece in left hand so that the folded edge is to the left and the button-

holes run along the length of the finger. Do not pull edges far apart, because they ought to touch when the buttonhole is worked. Insert needle one eighth of an inch from the near edge at right-hand end of buttonhole. Overhand

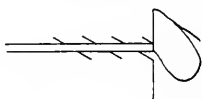


Figure 33. Position of needle for buttonhole stitch.

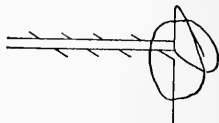


Figure 34. Position of thread for buttonhole stitch.

the edges of the near edge of buttonhole; turn the practice piece so that the other edge becomes the near edge. Overhand these edges. Do not make the stitches close nor draw the thread tight. It is best not to overhand at the ends of buttonholes. Turn the buttonhole half way around to its original position. At the right-hand end of the buttonhole, insert the needle one eighth of an inch from the near edge. Take the two threads from the eye of the needle and bring them from the right toward the left under the point of the needle. Draw the thread quite tight. Continue along the near edge of the buttonhole, making the stitches close enough so that the threads barely touch one another. The outer end of the buttonhole is fanned. It must be

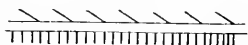


Figure 35. Finished edge of buttonhole.



Figure 36. Rounded end, or fan, of buttonhole.



Figure 37. Pulling thread to make fan.

carefully planned. One stitch extends from the end of the buttonhole. Space the other stitches. These are farther apart in the material and closer together at the corner of the buttonhole than the stitches along the edge, but they are of the same depth. After each stitch, draw the thread

tight and in the direction of the buttonhole stitch. The little knots or purls at the end of the buttonhole must be closely packed, one beside the other. When working the fan, turn the piece gradually around, so that you always put the needle in directly toward you. Continue, buttonholing the second edge in the same way as the first. Finish the inner end of the buttonhole with a bar. Make two or three stitches the length of the first and last stitches. Work four or five buttonhole stitches over these threads, but do not take in any of the cloth. Buttonholes running lengthwise in a garment are barred at both ends.

8—Sewing Apron. (Twelve Lessons.)

Materials: Use twelve and one half or fifteen cent checked gingham. One piece, twenty-four inches by twenty-two inches, one piece, the waist measure plus three inches by two and one half inches, number 7 needle, and number 60 or 70 thread for basting and gathering, number 8 needle and number 80 thread for hemming, overhanding and backstitching; number 7 crewel needle and silkateen for the ornamental stitch.

Directions: Make a one eighth inch hem at each of the edges of the large piece; a one and one eighth inch hem across one end. Have the three hems face the same side. On the right side ornament the wide hem with catstitch or featherstitch. Hold the right side of the apron toward you, the wide hem down. Turn this end of the apron up to form an eight inch pocket. Baste at sides, keeping edges of hems even, then overhand. Next remove basting threads, press seams flat, turn pocket and push out corners. Ornament the hem above the pocket with the same stitch as used on wide hem, and continue to the bottom of the apron. Divide the pocket into three equal sections and catstitch or featherstitch between them. Gather apron across the

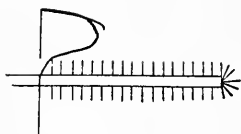


Figure 38. Needle in best position to make bar at end of buttonhole.

top. Baste to band, having fullness hang straight from the band when worn. Use the backstitch when sewing it on the band. This seam faces the wrong side, when the garment is made by hand. Turn the other edge

of the band and fold over this seam, just to cover the stitches; turn in the edges of band beyond the edges of the apron, and at the ends of the band. Baste. Overhand ends and lower edge of the band at each side of the apron, and fell the band down across the apron. Ornament both edges and ends of band. Work a buttonhole in the right-hand end of the band. Sew a button three fourths of an inch from the other end. In sewing on a button the stitches should extend in the same direction as the buttonhole. The thread may be knotted, if the knot is put on the right side so that the button will cover it. Fasten the thread securely when the button is sewed on.

9—Hemmed Patch. (Three Lessons.)

Materials: For the practice piece, or model, use one eighth inch checked gingham, one piece six inches square, one piece four inches square; number 7 and 8 needles, number 70 and 80 thread.

Directions: Cut the material between checks. Place the small square in center of large square so that the warp threads run the same direction in both pieces and so that white stripes fall on white stripes and colored stripes fall on colored stripes. Cut out a square in center of large square, eight checks smaller than patch. Cut diagonally through one check at each corner of this hole and turn back each of four edges one check. See illustration of hemmed patch. Place patch over the hole, matching stripes and warp. Baste

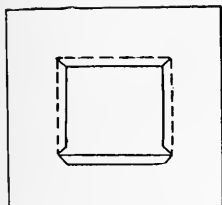


Figure 39. Preparation for hemmed patch.

patch in place, two checks in from edge. Turn in edges of patch one check. Baste near the turned-in edge. Turn the other side toward you, and baste the turned-in edge to the patch. Hem this edge down; also hem around the patch on the wrong side. Overcast the edge of model. Use the coarser needle and thread for basting, the finer for hemming and overcasting.

10—Application of Hemmed Patch. (Three Lessons.)

Materials: A gingham or calico apron or dress, or a grain sack; same kind of material for patch; needles and thread of suitable size.

Directions: Cut out the worn portions, making a square or rectangular hole. If the material is figured, striped, or checked, match the design before cutting the patch. Allow one half inch on each of the four edges of the patch. Proceed as in the hemmed patch.

11—Hemstitched Towel. (Five Lessons.)

Materials: One yard of huckaback or linen crash; number 7 needle and number 70 thread.

Directions: Draw six threads two and three fourths inches from each end. Turn in one fourth inch, then turn hem and baste securely, making sure that edges are even at ends of hem. Overhand ends of hems. Hemstitch hems.

12—Darning Three-Cornered Tear. (Three Lessons.)

Materials: A piece of light colored woolen material, ravelings of the same material, or thread to match, a number 7 crewel needle, or a number 7 needle.

Directions: Make a three-cornered cut in a piece four or five inches square. For the first darn the pupils should use thread. Cut the cloth on the straight of the goods to

get the ravelings. Use the crewel needle, if using ravelings. The stitches making the edges meet are not removed. Supply the warp and woof threads. In crossing the cut edges

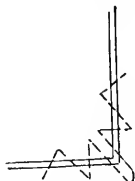


Figure 40—Making edges of three-cornered tear meet.

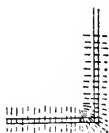


Figure 41—Fanned three-cornered darn.



Figure 42—Following warp and woof in the three-cornered darn.

go over one and under the other alternate times. The corner may be fanned, or the warp and woof threads followed. To hold down any ends of the cut threads, finish the darn with two rows of running stitches, following the cut or tear. Make all the stitches very short.

13—Application of Three-Cornered Darn.

(Two or More Lessons.)

Materials: Garment with three-cornered tear, ravelings to match, number 7 crewel needle.

Directions: Darn as for the three-cornered darn in Number 12.

SECOND DIVISION. OTHER YEAR.

1—Stitches. (Six Lessons.)

Materials: The same materials are used as in Number 1, Second Division, One Year, page 39.

Directions: Follow the directions given in Number 1, Second Division, One Year.

2—Flannel Seam and Hem. (Three Lessons.)

Materials: Two pieces of white flannel each eight inches by two and three fourths inches, numbers 7 and 8 needles, number 70 thread, sewing silk.

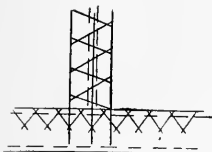


Figure 43. The flannel seam and hem.

Directions: Place the two pieces together so that all edges are even. Baste the two pieces together, the long way, one fourth inch from edge. Sew seam with silk, three sixteenths inch from the edge, using the running stitch with a backstitch for every needleful.

Baste the seam open, and catstitch. See cut for Flannel Seam. Across one end of this practice piece turn toward the wrong side a one and one eighth inch hem. Baste near the folded edge; then baste hem near its upper edge. Catstitch the hem.



Figure 44.
Showing wrong
side of flannel
placket.

3—Flannel Placket. (One Lesson.)

Materials: One piece of flannel eight inches by five inches, number 7 and 8 needles, number 70 thread, and sewing silk.

Directions: Find the middle of either end, and cut three and one half inches into the material, following the thread. Hold the piece of flannel so that the right side is toward you and the opening at the top. On the right-hand edge of opening make a seven eighths inch flannel hem. On the left-hand edge make a flannel hem three eighths inch wide at the top and tapering to almost nothing at the bottom. Catstitch at the bottom of placket to strengthen

it and to keep the right edge over the left.

4—Outing Flannel Petticoat. (Fourteen Lessons.)

Materials: Outing flannel, twice the desired length of petticoat plus one third yard, one piece of muslin, the waist measure plus two inches, by two and one half inches, number 7 needle, number 70 thread, number 7 crewel needle and silk-ateen.

Directions: Cut skirt by a two or a four-gore skirt pattern, allowing three inches for hem and from two to three inches for shrinkage. Make seams and hem as directed in Number 2 of this year's work. Cut a nine-inch placket in middle of back gore. Make the placket as directed in Number 3 of this year's work. If a sewing machine is obtainable, the seams and band may be stitched on the machine, but must be done under the teacher's supervision. Use the silkateen for the catstitching. Find center front of the skirt and the band. Pin these two points together, lay the extra fullness in plaits at the back, and pin at the seams, making the opposite ones equidistant from the center front. Baste the skirt together. This seam faces the wrong side of the petticoat. Sew the skirt to the band, using the backstitch and making the seam one fourth inch wide. Remove the basting thread. With the wrong side of the band toward you, turn the other edge of the band down one fourth inch. Fold the band toward the wrong side, just to cover the back stitching, pin in place, turn in the ends of the band, at least one fourth inch, and baste in place. Overhand the ends of the band and hem the lower edge of the band in place. See Number 6, for button and buttonholes.

5—Buttonhole Practice. (Two Lessons.)

Materials: The same as in Number 7, Second Division, One Year, page 43.

Directions: The same as in Number 7, Second Division, One Year.

**6—Making Buttonholes in the Band and Sewing Button
on the Band of the Outing Flannel Petticoat.
(One to Three Lessons.)**

Materials: Outing flannel petticoat, number 7 needle, number 50 thread, one pearl or vegetable ivory button.

Directions: Cut one buttonhole in the right end of the band a little below the middle. Work as directed above. Make buttonholes in the band to correspond with the buttons on the underwaist with which the petticoat will be worn. Bar these buttonholes at both ends. Sew on the button one half inch from the other end and slightly below the center of the band. See last part of Number 8, Second Division, One Year, page 45.

7—Flannel Patch. (Two Lessons.)

Materials: Two pieces of flannel, one six inches square, one four inches square, number 7 needle, number 70 thread, and sewing silk.

Directions: Cut a hole three inches square in center of large square to represent the worn portion. Place evenly over the hole, having the wrong sides of both pieces toward you. Baste near the edge of the patch, and near the edge of the hole. Catstitch patch in place and around the edge of hole.

8—Application of Flannel Patch. (Two Lessons.)

Materials: A flannel garment, a piece to match for the patch, sewing silk to match, number 7 needle, number 70 thread, sewing silk.

Directions: Cut away the worn portions making hole rectangular, if possible. Cut patch one inch larger each way than the hole. Proceed as in Number 7.

9—Three-Cornered Darn. (Three Lessons.)

Materials: Same as in Number 12, Second Division, One Year, page 47.

Directions: Same as in Number 12, Second Division, One Year.

10—Application of Three-Cornered Darn. (Two Lessons.)

Materials: Same as in Number 13, Second Division, One Year, page 48.

Directions: Same as in Number 13, Second Division, One Year.

11—Double Hemstitched Towel. (Six Lessons.)

Materials: Same as in Number 11, Second Division, One Year, page 47. Or use one and one half, or one and three fourths yards of material, and make a dresser scarf.

Directions: Same as in Number 11, Second Division, One Year. Hemstitch along the other edge of the space where threads have been drawn. Take the same threads to a stitch as were taken in opposite stitch of the single hemstitching.

12—Plain Seam. (One Lesson.)

Materials: Two pieces of gingham, each eight inches by three inches, number 7 needle, number 70 thread.

Directions: Baste these two pieces together, one fourth inch from edge. Use the running stitch with a backstitch for each needleful in sewing them together. Remove the basting thread, trim the edges, if raveled, and overcast the two edges together.

13—Gingham Holder. (Three Lessons.)

Materials: One piece of gingham, calico or percale, twelve and one half inches by six and one half inches, four thicknesses of sheet wadding five and seven eighths inches square, number 7 needle, number 70 thread, silkateen.

Directions: Turn in edges of piece of gingham one fourth inch. Fold double, crosswise, crease and insert wadding. Baste, keeping corners and edges even. Overhand edges. Make two rows of running stitches, at right angles to each other at the center, to hold the wadding in place. Finish with a loop at one corner, as directed in Number 3, Second Division, One Year, page 40.

14—Gingham Work Apron. (Sixteen Lessons.)

Materials: Apron gingham, twice the desired length plus one half yard, number 7 needle, number 70 thread.

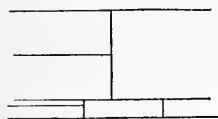


Figure 45. Diagram showing how to cut out apron.

Directions: Remove selvages, cut off a three-inch strip the entire length of piece of goods. Cut from the three-inch strip the ties, each twenty-seven inches long. The band is the waist measure less two inches by two and one half inches, and is cut from the remaining portion of the three-inch strip. Cut the large piece crosswise into equal parts. Cut one of these pieces, lengthwise, into halves. The large piece is the front, and the two narrow pieces are the sidepieces of the apron. On each edge of the ties and one edge of each of the sidepieces of the apron make a one eighth inch hem. Make plain seams in apron, a three-inch hem at the bottom of the apron, and a one-inch hem at one end of each tie. Gather the apron across the top and gather each tie at the end not hemmed. Sew apron and ties to the band. See Sewing Apron, Number 8, Second Division, One Year, page 45.

THIRD DIVISION ONE YEAR

1—Laundry Bag. (Six Lessons.)

Materials: One and one half yards of white linen crash toweling, three yards of three eighths inch tape, number 7 needle, number 70 thread.

Directions: Make a two-inch hem at each end of the piece of toweling. In the hem make a row of backstitches one half inch from the hemmed edge, thus forming a casing for the tape. Fold double, crosswise. With edges on each side even and the hems even, baste together the edges on each side, beginning just below hem. Overhand edges together on each side. Fasten thread by sewing over the

end of it. Remove the basting threads and turn right side out, push out corners, and smooth out overhand seams. Cut tape in two. Draw it into casing, starting one piece at each side and bring each all the way around. Sew up the two ends of each tape, making a felled seam. See Number 4, of this year's work.

2—Overhand Patch. (Two Lessons.)

Materials: Two pieces of one eighth inch checked gingham, one six inches by six inches, one four inches by four inches, number 7 needle and number 70 thread.

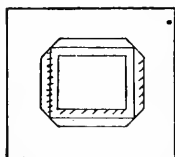


Figure 46. Overhand patch showing details of the work.

Directions: Match stripes and warp and cut away the supposedly worn portion as in Number 9, Second Division, One Year, page 46. Cut diagonally through two checks at each corner of the hole. Turn the edges on each side of the hole down two checks. Lay the piece thus prepared on the desk wrong side up. Place the patch evenly over the hole, matching stripes and warp. Turn the edges down two checks on each side of patch. (When turning an edge always turn it toward yourself.) Then place the patch in the space it is to fill, matching stripes and warp. Baste together the two edges that touch, the wrong sides out, and overhand these two edges together. Then remove the basting thread, baste the two adjacent edges, overhand, and so continue around the patch. Press the overhand seam as smooth as possible and overcast all the raw edges.

3—Application of the Overhand Patch. (Three Lessons.)

Materials: A garment in need of mending, a piece of the same material, number 7 needle and number 70 thread for basting, needle and thread or silk suitable to use with material in garment.

Directions: Remove worn portion, making a square or rectangular hole; fit the patch to it, matching the design and warp; and cut the patch one half inch larger than the hole on each of four edges. Proceed as in Number 2 of this year's work.

4—Felled Seam. (One Lesson.)

Materials: Two pieces of outing flannel, eight inches by three inches, number 7 needle and number 70 thread.

Directions: Place one of the pieces on the other, so that the ends are even and the one long edge of the under piece extends three sixteenths of an inch beyond the edge of the upper piece. Baste one half inch from the edge farthest out. Stitch just outside of the basting. Remove the basting thread. Turn in the wider edge one fourth inch; then turn this part of the seam flat over the narrow edge of seam and baste the turned-in edge to the material. Stitch very close to the turned-in edge.

5—Outing Flannel Nightgown. (Ten Lessons.)

Materials: Three times the required length plus one yard of outing flannel, number 7 needle, number 70 thread and a sack nightgown pattern.

Directions: Cut out all parts, allowing for the growth of the individual and shrinkage of the material. Make felled seam on the shoulder, under the arm and in the sleeve, having the back come over the front. Hem fronts the desired length for opening. Stitch the two fronts together below opening. Hem the lower edge of sleeve and gown. Gather the sleeves at the top, and baste them into the armhole. If the sleeves are in correctly, stitch them, making a half-inch seam. Remove the basting thread and overcast the two edges together. Baste this half-inch seam to the adjoining parts of the gown, stitch again one fourth

inch from the overcast edge. Cut one piece as for a lay-down collar; sew it to the gown around the neck, with the seam toward the right side. Remove the basting thread, turn collar toward the right side of gown, and baste around the neck. Turn in the edge of the collar and baste it to the gown. Stitch.

6—Buttonholes. Review. (One Lesson.)

Materials: The materials are the same as given in Number 7, Second Division, One Year, page 43.

Directions: The directions for making the buttonholes are the same as given in Number 7, Second Division, One Year.

7—Buttonholes and Buttons. (Three Lessons.)

Materials: Nightgown (see Number 5, of this year's work), number 7 needle, number 50 thread, and six half-inch pearl buttons.

Directions: Work six buttonholes as directed in Number 7, Second Division, One Year, page 43, in the right-hand portion of the front of the nightgown. Sew buttons as directed in Number 6, Second Division, Other Year, page 50, on the left-hand portion of the front of the gown to correspond with the buttonholes.

8—Stockinet Darning. (Six Lessons.)

Materials: The materials are the same as given in Number 5, Second Division, One Year, page 41.

Directions: The directions are the same as given in Number 5, Second Division, One Year.

9—Sleevelets. (Three Lessons.)

Materials: One half yard of thirty-six inch wide muslin or India linen, needle and thread to correspond with material. A "leg-of-mutton" sleeve pattern with but one seam.

Directions: Cut sleevelets sufficiently large to go on over dress sleeves and to reach from the wrist past the elbow, allowing for a three fourths inch hem at the lower edge, and a three eighths inch hem at the upper edge. Make a French seam in sewing the sleeve, and hem the upper and lower edges.

10—Hemming Curved Edge. (One Lesson.)

Materials: One piece of fine muslin or India linen, seven inches by seven inches, number 7 or 8 needle, number 70 or 80 thread.

Directions: Choosing any one corner as the center, with seven inches as a radius, cut an arc of a circle. Turn, and baste a hem less than one eighth inch wide. Hem.

11—Cap. (Four Lessons.)

Materials: One half yard of fine muslin or India linen, number 7 needle, number 70 thread, number 9 needle, and number 90 thread, and one piece of elastic to fit head.

Directions: Cut a circle eighteen inches in diameter from the muslin. To cut a true bias fold the material so that the warp threads fall on the woof threads, then cut on the fold. Cut one and one half yards of bias strips seven eighths of an inch wide. Make a one eighth inch hem around the cap. Turn each edge of the bias strip one eighth inch under and baste it at each edge two inches from the edge, on the wrong side of the cap. Cut off the extra amount of the bias strip, allow enough with which to hem each end and stitch bias strip at each edge to the cap.

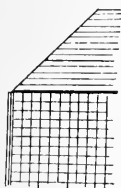


Figure 47.
Folding the
material for
a true bias.

12—Application of Patches and Darns. (Two to Six Lessons.)

Materials: See Number 5, Number 10 and Number 13, Second Division, One Year; Number 8, Second Divi-

sion, Other Year; and Number 3, Third Division, One Year.

Directions: For directions see the same numbers as for the materials.

13—Tray Cloth or Doily. (Four Lessons.)

Materials: One piece of medium fine linen of the desired size, number 7 needle, number 70 thread.

Directions: Draw six threads one and one half inches from each edge. See cut of miter, Number 5, Third Division, Other Year. Baste hems and double hemstitch as in Number 11, Second Division, Other Year, page 52.

14—Buttonholes. (Four Lessons.)

Materials: Garments brought from home, needle and thread of suitable sizes, the thread to match the color of the material.

Directions: For directions see Number 7, Second Division, One Year, page 43.

THIRD DIVISION. OTHER YEAR

1—French and Felled Seams. (Two Lessons.)

Materials: Three pieces of muslin or gingham, each eight inches by three inches, numbers 7 and 8 needles, numbers 70 and 80 thread.

Directions: For the French seam, baste the long edges of two pieces one fourth inch from the edge. Sew one eighth inch from the edge. Remove the basting thread, and trim the edges slightly, to remove all frayed edges. Turn the other side of material toward you and baste the seam just made within the seam. Stitch this seam one eighth inch from edge. For the felled seam, see directions for Number 4, Third Division, One Year, page 55. Make it one eighth of an inch wide.

2—Long Sleeved Apron. (Six Lessons.)

Materials: Three times the length from shoulder to bottom of skirt plus one yard of gingham or print. If percale is used, add one half yard to three times the required length. Number 7 needle, number 70 thread and a long sleeved apron pattern with straight lines.

Directions: Cut out apron, allowing for shrinkage of cloth and growth of child. Make French seams, remembering that the first time they are basted toward the right side of the material. Sew in the sleeves; finish the neck and bottom the same as the nightgown, when the two edges in the back have been hemmed. Make two pockets, each seven inches by six inches. Sew one pocket on each side of the front of the apron.

3—Buttonholes in Apron. (Four Lessons.)

Materials: Apron, number 7 needle, number 50 thread, and eight one half inch pearl buttons.

Directions: See Number 7, Second Division, One Year, page 43, and Number 7, Third Division, One Year, page 56.

4—Marguerite. (Seven Lessons.)

Materials: One yard of muslin, two yards of lace with beading, one piece of linen tape three sixteenths inch wide, number 7 and 8 needles, number 70 and 90 thread, and corset cover pattern.

Directions: In cutting out the material remember the marguerite slips on over the head, and that it is best not to cut it very low around the neck. Make a felled seam on the shoulder, a French seam under the arm, and a one eighth inch hem at the bottom, around the neck, and at the armholes. Make a felled seam when joining the lace. Sew the lace around the neck and armholes with the overhand stitch. Full the lace slightly under the arm in front of the

under-arm seam. Have the right sides of the marguerite and of the lace face each other, with the lace on the thumb side, the side nearest you. Prepare a bias fold as directed in Number 9, Second Division, One Year, to fit across the back at the waistline. Baste in place and stitch. Draw a piece of tape long enough to tie around the waist through the casing formed by the bias fold. Draw the tape into the beading and tie.

5—French Hem and Miter. (One Lesson.)

Materials: A seven-inch square of medium fine linen, numbers 7 and 8 needles, numbers 70 and 80 thread, and a four-inch square of stiff paper.

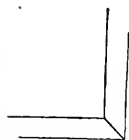


Figure 48.
Mitered hem.

Directions: From one corner of the paper, measure five eighths of an inch on each side, connect these two points with a straight line, and cut along this line. Cut one corner of square by this pattern. Turn each of the adjoining edges one eighth of an inch, then a one fourth inch hem. Baste near the turned-in edge. Fold the hem back on one side and overhand the two folded edges. In a similar manner hem the other side adjacent to the mitered corner. Hem the miter at the corner.

6—Application of French Hem. (Six Lessons.)

Materials: Two napkins brought from home, numbers 7 and 8 needles, and numbers 70 and 80 thread.

Directions: Napkins have selvages on two edges. Cut the other two edges straight by the thread. Make a one fourth inch French hem at each of these two edges.

7—Gingham Underskirt. (Eight Lessons.)

Materials: Twice the skirt length plus three fourths of a yard of striped gingham, number 7 needle, numbers 70

and 50 thread, one medium-sized pearl button, and a plain five-gore skirt pattern.

Directions: Cut the gores two inches shorter than the desired length, three pieces across the material, each five and a half inches deep, for the ruffle, one piece, the waist measure plus two inches by two and a half inches for the band, one piece twenty inches by two and a half inches, for the extension placket, and enough bias strips to face edge of ruffle and to finish seam at upper edge of ruffle. Make French seams in skirt, leave a nine and a half inch placket at the top of the back seam, join with plain seams the three pieces of the ruffle and the bias strips. To face one edge of the ruffle with the bias strip, put the right side of bias to the wrong side of the ruffle, having their edges even, baste and stitch three sixteenths of an inch from edge. Remove the basting thread, turn the bias strip toward the right side of ruffle, baste at the edge, and turn under the upper edge of the bias strip. Baste and sew at the upper edge. Divide the ruffle into quarters and notch it; then gather it at its upper edge. Divide the lower edge of the skirt into quarters, starting at center back. Pin ruffle and skirt together at notches, the wrong sides together. Baste the two, arranging the gathers evenly. Then baste the bias strip to the ruffle side of the seam just basted, having the right side of the bias strip face ruffle. Stitch, and remove the basting threads. Turn the bias over the seam and baste at its lower edge. Finish as at lower edge of the ruffle. To make the extension placket, place the piece cut for it on the wrong side of the skirt; starting at the upper end of the right-hand portion of the placket opening, baste in place; taking particular care at the lower end of the placket, sew; remove the basting thread; turn the other edge one fourth of an inch and bring it over the seam to just cover the stitches.

Baste, sew, and remove basting thread. To sew the skirt to the band, first notch the middle front of the skirt. Then notch the band one and one fourth inches to one side of the middle. Place the band on the wrong side of the skirt. Pin the notches together, with the longer portion toward the left side of the skirt. At the back pin the skirt to the band, the left portion of placket extended, and the right portion turned back. Dispose of the extra fullness by gathering or laying it in plaits, whichever way is the most desirable. Remember that the skirt must hang straight from the band. Baste, and stitch the skirt to the band. Continue as directed in Number 4, Second Division, Other Year, page 49. Work a buttonhole in the right-hand end of the band and sew the button on the band at the left-hand end. Have the ends of the band overlap the width of the extension placket one inch.

8—Muslin Nightgown. (Eight Lessons.)

Materials: Twice the length from the shoulder, at the neck, to the floor, plus one half yard of thirty-six inch muslin, two yards of lace with beading, one piece of one fourth inch linen tape, numbers 7 and 8 needles, numbers 70 and 80 thread, and a nightgown pattern.

Directions: The pattern used in Number 5, Third Division, One Year, could be used, or a nightgown pattern with butterfly sleeves. One third yard less material is required for the pattern with butterfly sleeves. If the pattern mentioned first is used, allow two inches at the center for fullness. Add three inches for hem to the required length. If it is necessary to piece the front on each side at the bottom, make plain seams. (Make felled seams on the shoulder and French seams under the arm and in the sleeve.) Make a three-inch hem at the bottom, and a one eighth inch hem

around the neck and at the lower edge of sleeves which are of elbow length. Gather the sleeves at the top. Baste sleeves into armholes, and fit them. If the sleeves fit properly, sew them, making a three eighths inch seam. Overcast the raw edges, putting a stitch through each of the gathers. Sew on the lace as directed in Number 4 of this year's work. There are, of course, no separate sleeves, if the butterfly pattern is used.*

9—Sofa Cushion Cover. (Four Lessons.)

Materials: Two pieces of linen or cretonne twenty-two inches by eighteen inches, two pieces each twenty-two inches by two and a half inches, thread to match, number 7 needle, number 70 thread, and four clasps.

Directions: Face, with the narrow strips, one edge of each of the large pieces. Place the two large pieces with the faced edges together and the right sides so as to face each other. Baste and sew one fourth inch from the edge at the ends and the side not faced. Remove basting threads, trim slightly the two corners just stitched, turn, and push out the corners. Baste near the edge of the three stitched sides; baste a second time two and one eighth inches from the edge; and stitch two inches from the edge. Sew the clasps near the hemmed edges of the facings at the opening. The top may be ornamented with a stenciled design, crocheted motifs, or embroidery, if cover is of plain material.

HOME PROJECTS

Patterns may be altered. A plain gored skirt pattern, if it is too long, may be shortened by laying a plait across each gore at half the distance down from the top. Have the edges even at the front or the part of the pattern that will come on the straight of the goods. If the pattern is too large around the hips, lay equal sized plaits lengthwise

through the middle of each gore. Sleeve patterns are reduced in a similar manner. If a plain waist pattern is "long waisted," determine whether the extra length is above or below the bust line or both. Shorten the pattern where it is too long. If a pattern is too wide across the shoulder, make a lengthwise plait through the middle of that portion, and, if too wide under the arm, do the same there. If a pattern is too narrow or too short, determine where to enlarge. See above how to reduce. Cut the pattern and insert a strip of paper of the required width.

Wash goods of linen or cotton and woolen goods should be shrunk before making up. A tablespoonful of salt added to each quart of lukewarm water used when shrinking the wash goods sets the color. When pressing the material keep the edges straight.

If the material is figured, checked or plaid, decide which is up and which is down and cut all parts the same way.

1.—Pair of Drawers

Materials: Muslin, twice the length from the waist-line to the bent knee plus six inches, two and a half yards of five-inch or six-inch embroidery, thread and needles of suitable sizes, and a good pattern.

Directions: Tear off a strip of the material at one end to straighten it, and pull the goods straight, if it seems uneven. Turn up the lower edge of the pattern five or six inches, the width of the embroidery. Place pattern on goods with its lower edge on the straight end of the cloth and cut one part. To cut the corresponding part, use the piece just cut, placing the woof threads in it on the woof threads of the larger piece of cloth. Cut two pieces, one for the placket and one for the band the same as in Number 7, Third Division, Other Year. When sewing the (short) seam in each of the two large portions, make a felled seam.

Join with a felled seam the two portions, which should be pairs, having the two short seams meet.

If the placket is desired at the back, leave the length of it when sewing this seam. Or, the placket may be made at either side. Make the placket and sew skirt to the band as in Number 7, Third Division, Other Year. Turn up the lower edge five eighths of an inch toward the wrong side. Baste near folded edge. Stitch, making a three sixteenths inch tuck. Cut the embroidery into two equal pieces, trim upper edge, if it is uneven. Match the pattern and join with a plain seam. For convenience later, divide each flounce into fourths, starting at the seam, marking the upper edge with a notch or pin. Gather each flounce. Divide the lower edges of drawers into fourths, starting at the seams. Pin a flounce to the raw edge of each portion, placing seams together, also wrong sides, and notches. Baste, arranging gathers uniformly, stitch each three sixteenths of an inch from edge and remove basting threads. Turn the seam up and baste the tuck down over it and baste the tuck in place. Stitch in the very edge of the tuck. Finish the band with a button and buttonhole.

2—Wash Dress

Materials: Select material that will launder nicely and that is suitable to the wear you wish to give the dress and of becoming color, the correct size of a simple pattern, of suitable style for a wash dress, thread to match the material, and buttons or No. 2 hooks and eyes.

Directions: Styles change so frequently that but few general directions can be given. Study and follow directions with the pattern. Fit pattern, alter if necessary, and lay all parts of it on the goods before beginning to cut. It is sometimes necessary to rearrange the parts of the pat-

tern in order to cut goods economically. Make French or plain seams in skirt depending on the material, an extension placket as in Number 7, Third Division, Other Year. Baste the skirt to the band. See that the seams in the skirt hang straight, that it does not pull anywhere and that it is even at the bottom. Finish the band neatly at the ends, being careful to make the two edges of the placket the same length. When turning the hem, dispose of the fullness of its upper edge by laying a small plait in the part of each gore that is on a bias. If one plait disposes of fullness but makes the skirt longer at that place, make two a small distance apart. The lower edge of a plain gored skirt is uniformly curved, if the hem is turned correctly and no unusual alterations have been made to make it fit. Finish the waist neatly at the neck, the bottom, the lower edge of the sleeves, and where it fastens. When putting in the fasteners, whether it be buttons and buttonholes, or hooks and eyes, make sure that they will fulfill their purpose of keeping the garment properly adjusted. If the dress requires a belt or girdle, sew fasteners in it.

REFERENCES FOR SEWING

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CHAPTER IV

PRINCIPLES OF HOME SCIENCE

It is not the intention of the authors to advocate that laboratory work should be done in one-room schools. The general principles here discussed are such as all girls should understand, however, and the school lessons may be supplemented by home work in cooking. Such an arrangement will not be difficult to carry out in small schools. Semigraded and consolidated rural schools should provide for laboratory work.

HUMAN BODY AND STEAM ENGINE COMPARED

In comparing the human body with a steam engine we find that they are similar in that both require fuel to produce heat and energy, or power to work. The body uses food for fuel and the engine uses wood or coal. They are similar in that both require material for building and repairing their several parts. The engine is built of different material from that which it uses for fuel. The body may consume its own materials to produce heat and energy, if necessary. The growth, or development, and uses of the various organs, such as the heart, lungs, etc., depend upon the nutrition of the body.

FOOD DEFINED

The uses of food are (1) to build the body and keep it repaired, and (2) to yield heat to keep the body warm and to supply energy for work. Atwater says, "Food is that which taken into the body builds tissue and yields heat and energy."

FOOD PRINCIPLES, OR NUTRIENTS

The body is composed of from fifteen to twenty elements. The most abundant are oxygen, hydrogen, nitrogen, cal-

cium, phosphorus and sulphur. These elements form a number of compounds, the most important being carbohydrates, protein, fats, mineral matter and water. These compounds occur in the body and, obviously, they are also found in the food which builds the body. The first four compounds are often referred to as the food principles, or nutrients. Water is not classified as a nutrient, because it does not build tissues or yield heat. It is, however, a very important constituent of food. Each of the food principles has a special function, or use, in the body.

Carbohydrates

Carbohydrates, such as starches and sugars, yield heat and energy. Vegetables, cereals and fruits supply the carbohydrates, with the exception of milk sugar which is found in milk. Each particle of starchy foods, such as cereals, potatoes, etc., contains a mass of minute starch grains. Each starch granule is surrounded by woody fiber, called cellulose. Such foods as potatoes, oatmeal, cornmeal, macaroni, rice, etc., should be cooked to soften the cellulose and permit the starch grains to swell and burst. About 1 per cent of the weight of the human body is composed of carbohydrates.

Vegetables. Select firm vegetables and wash clean. Potatoes, parsnips and other roots and tubers should be pared or scraped, and cut as desired. For creamed dishes, they are usually cut into half-inch cubes or one-eighth inch slices. Place in cold water to prevent discoloration. Put to cook in boiling water, usually just enough to cover the vegetables. Cook strong flavored vegetables uncovered. Parboil strong flavored vegetables, drain and add more boiling water. When vegetables are about half-cooked, add a tablespoonful of salt for each quart of water in which they are being cooked. Cook vegetables until tender. A time-table is suggestive.

The variety, quality and age of vegetables make the difference in the length of time it takes to cook them. As soon as they are cooked, drain off the liquid and save it, if it is to be used. Cover the vegetables with several thicknesses of clean cloth, that the steam may escape, but the heat be retained. If a cover is placed over the kettle, the steam remains in it, which, as it cools, makes the vegetables soggy. Use the liquid in which vegetables are cooked when making cream soups or creaming vegetables.

In the process of cooking, the water dissolves the nutrients, and flavors are withdrawn from the vegetables. Before combining the vegetable and the liquid in which the vegetable has been cooked with milk or white sauce, add soda if the vegetable is acid, as tomato or cabbage, the amount depending upon the acidity of the liquid. Otherwise, the milk will curdle.

Cereals. Like vegetables, cereals are put to cook in boiling water. Use from two and one half to five parts of water to one part of the cereal, as cereals need to absorb much water in the process of cooking, because they contain but a small amount. Cook cereals in salty water directly over the fire for the first ten minutes, stirring occasionally, so that the mixture does not stick to the bottom of the kettle or to the upper part of the double boiler. Place in the lower part of the double boiler in which is boiling water, or in a fireless cooker, and continue cooking for a long time. Long slow cooking is necessary on account of the large amount of cellulose that cereals contain. This must be softened. Use from one to one and one half tablespoonfuls of salt to one quart of water.

Fruits. With the exception of quinces and cranberries, fruits are eaten mostly in the fresh state. Use only sound, ripe specimens. Unripe fruit is not very digestible, unless

cooked, and overripe fruit lacks flavor. Serve fresh fruits in season and serve them cold. Cooked fruits are usually either baked or stewed. Baking is used with large whole fruits, such as apples, pears and bananas. Stewing may be used for all kinds of fruits. Dried fruits, such as prunes, figs, apples, apricots, etc., should be soaked in fresh water for several hours before cooking.

Protein

The protein compounds are the most important nutrients. They are the muscle builders and assist in the building of the body tissue. About 18 per cent, by weight, of the body of the average person consists of protein compounds. These compounds contain nitrogen.

The chief sources of protein are eggs, lean meat, milk, cheese, legumes and cereals. Some of the protein compounds and their sources are albumin in egg white, albumin and myosin in meat, casein, or curd, in milk, legumin in peas and beans and gluten in wheat. The protein-supplying vegetables are the cheapest source of food for muscle building.

Eggs. There is no waste to eggs except the shells. If properly cooked, or not cooked at all, the egg is readily digested. Heat coagulates the albumen, or the egg white, and cold water dissolves it. If intense heat is used, the white becomes tough. The yolk and white of egg are evenly cooked if a temperature below the boiling point of water, 212°F., is used.

The following is a simple test for eggs to be used for the table or in cooking: Place the egg in a tumbler two thirds full of water. If it sinks and lies horizontally on the bottom of the tumbler, it is suitable for poaching or soft or hard cooking. If the large end of the egg is raised a little, the egg is not strictly fresh. If the large end is raised

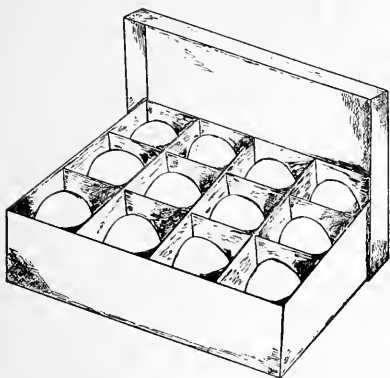


Figure 49. Eggs in cartons, the neatest and most attractive way to sell or buy.

considerably more, the egg is not suitable for the table, but can be used in cooking. If the egg comes to the top, it is not fit for food.

To hard-cook an egg proceed as for "Soft-cooked Eggs" in the hot lunch recipes, Chapter V. At the end of ten minutes, remove from the hot water and cover with boiling water. Let the

egg remain in this water for ten minutes. Keep dish where the water will keep hot but not boil. Remove from the hot water and place in cold water for a second or two, so that the egg white will not stick to the eggshell.

Eggs can be used with a large number of food materials, because their flavor is not pronounced and, therefore, blends readily with other flavors. When combining egg with a hot mixture of any kind, add the mixture slowly to the beaten egg, while stirring, in order to cook the egg slowly. Egg is used to make mixtures light with enclosed air by beating the egg yolk and white separately, or by adding the egg to the mixture and beating until light. The first method will produce the most feathery product; the second, the finer grained, but more compact. Egg mixtures, as well as eggs, should be cooked slowly and not longer than necessary. Cakes containing a large quantity of eggs shrink, if baked too long. If custards are steamed or baked too long, or with too intense heat, whey will form. Directions for making custards are given in recipes in Chapter V. Eggs are used to

thicken liquids, as pudding sauces. They are also used to clear liquids. To clear beef broth, stir the white of egg, slightly beaten, into the lukewarm broth and allow it to come to a boil. Egg white is used to clear coffee, as given in the directions for making coffee with egg, page 94.

Lean Meat. Meats are the most expensive of the protein-supplying foods, on account of the high cost of production and the length of time necessary to cook them. Only the lean of meat supplies protein. This chapter permits only a brief and general discussion. The kinds of meats are beef, veal, mutton, lamb, pork, game and poultry. The flavor and tenderness of certain cuts of each kind of meat make them at least seem more desirable. They are more desirable to those who can spend but a few minutes on the preparation of their meats. Refer to the figures representing the different cuts of meat. Start at the loin, which is regarded the choicest on account of the flavor and

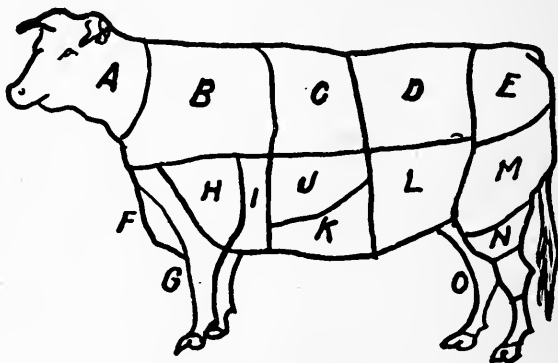


Figure 50. Diagram of cuts of beef.

- | | | |
|-----------|----------------|----------------------|
| A. Neck. | F. Brisket. | K. Navel. |
| B. Chuck. | G. Fore shank. | L. Flank. |
| C. Ribs. | H. Shoulder. | M. Round. |
| D. Loin. | I. Cross ribs. | N. Second cut round. |
| E. Rump. | J. Plate. | O. Hind shank. |

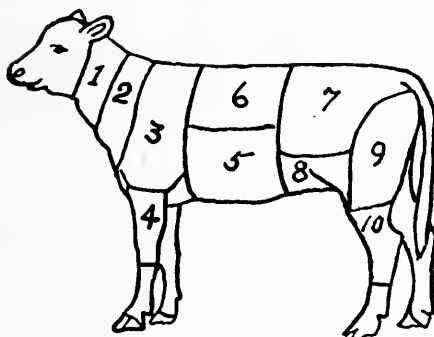


Figure 51. Diagram of cuts of veal.

- | | |
|----------------|-----------------|
| 1. Neck. | 6. Ribs. |
| 2. Chuck. | 7. Loin. |
| 3. Shoulder. | 8. Flank. |
| 4. Fore shank. | 9. Leg. |
| 5. Breast. | 10. Hind shank. |

tenderness. The cuts at either side are less tender, and the farther from the loin, the tougher, as the neck, the shin and the shank. The food value, the amount of protein supplied, is practically the same regardless of the location of the cut, from the same kind of meat.

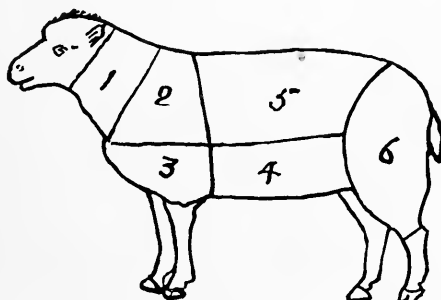


Figure 52. Diagram of cuts of lamb and mutton.

- | | |
|--------------|-----------|
| 1. Neck. | 4. Flank. |
| 2. Chuck. | 5. Loin. |
| 3. Shoulder. | 6. Leg. |

In order to render the tougher and less pleasantly flavored cuts of meat palatable, one must understand the effect of heat and moisture upon meat. Albumin coagulates when heat is applied, and it dissolves in cold water. The tissue which surrounds the fibres and bundles of fibers that make up the muscles and encloses the muscle itself is called connective tissue. The muscles taper toward the ends where there is more and stronger connective tissue, gradually forming the tendons. The tendons attach the muscles to the bony frame. When a muscle shortens, it contracts through the largest part of it, and some part of the body moves. The muscles receiving the most exercise are the strongest and are, consequently, the toughest on account of the large amount of connective tissue in them. When dry heat is applied to meat, the connective tissue is hardened. Moist heat softens it. Keeping these facts in mind and applying them when cooking meats, one need not have tough meat.

If we wish to broil or roast meats, we must have tender cuts, because we apply dry heat. See "Methods of Cooking," page 84. Upon the cutting and cooking of a beefsteak, depend its tenderness. Only tender cuts, the loin

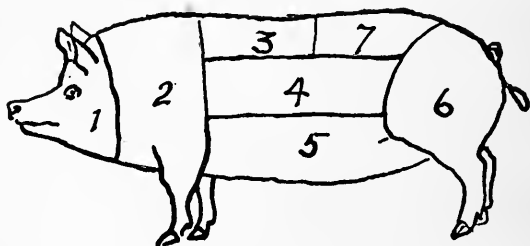


Figure 53. Diagram of cuts of pork.

- | | |
|----------------|-----------|
| 1. Head. | 5. Belly. |
| 2. Shoulder. | 6. Ham. |
| 3. Ribs. | 7. Loin. |
| 4. Middle cut. | |

and one or two steaks cut from the round of young, well-fed beef, can be broiled to advantage. The steak should be cut at least an inch thick. The heat should be sufficient to sear the cut surfaces quickly and the steak should be turned frequently to apply the heat evenly to both sides. When the meat is seared, the albumin near the surface is coagulated. This coat of coagulated albumin retains the juices of the interior. Now, if the steak is cut thin, when the surfaces are seared, all the albumin is coagulated—the exterior coat extends from each side to the center of the cut—and there are no juices left to produce a juicy, tender steak. If a roast is to be cooked in the oven, its cut surfaces must be seared in order to retain the juices. This can be done either by searing it in a pan on top of the stove, or the oven may be very hot when it is put into it, and the heat decreased when the meat is seared.

The tough cuts of meat should be treated in just the opposite way—cooked with moist heat and put to cook in cold water, so none of the albumin will be coagulated in the meat. The tougher cuts of meat require more seasoning, and sometimes small quantities of vegetables are added to improve and vary the flavor. The less choice cuts of beef are often chopped, as Hamburg steak, meat loaf, etc. In this manner the connective tissue is cut into very short pieces. Pork, veal, mutton, lamb, poultry and game should not be cooked rare. They are more wholesome when thoroughly done.

Milk and Cheese. Milk and cheese belong to the protein-supplying foods. Clean milk is essential to good health. In order to have clean milk, the milk cans, pails, pans and bottles—everything in which milk may be kept—must be thoroughly washed, rinsed and scalded. The

milk should be cooled to remove the animal heat and then kept in a clean, cool and fresh place.

Milk is more easily digested if not boiled. It is pasteurized, scalded and sterilized to kill different kinds of disease germs, such as those of tuberculosis, typhoid and diphtheria. On account of its nutritive value, milk should be used in the preparation of other foods with which it is compatible. Milk is sometimes called a perfect food. It is, for the young. While it contains all the nutrients, milk is not a perfect food for adults, as too large quantities would be required to supply the solids necessary. Even the best milk is very largely water.

Cheese, being a milk product that consists almost entirely of the curd, or casein, should not be cooked with too intense heat nor for too long a time. It is a very concentrated food and should be eaten as such. Served as it usually is, with dessert at the end of a heavy meal, it is likely to cause indigestion. Eaten, as it should be, as the main protein part of the meal, it is wholesome and nutritious. Cheese dishes can thus be made a meat substitute.

Legumes and Cereals. The legumes are those plants that, with the aid of soil bacteria, have the power to use nitrogen directly from the air and deposit it in the soil. Such plants are clover, peas, beans, vetches, etc. Those used chiefly for human food are the peas, beans, lentils and peanuts. While these legumes are sometimes not regarded as choice food as meat cuts and some other foods, they are rich in protein. The same amount of nutrients can be obtained for a very small fraction of the cost of the expensive meats or eggs. Legume dishes can be made very palatable, as these important protein foods can be cooked in a great variety of ways.

Every person in charge of purchasing the food supplies

should be familiar with the nutrients in the common food stuffs, and select the kinds that give most nourishment for the money. Change enough for variety is necessary, of course; but a thorough knowledge of the various methods of preparing foods will often mean real economy, both as to nutrients and cost.

Average Composition of Common Food Stuffs

Compiled from Various Bulletins

| Kind of Food | Water | Protein | Fat | Carbo- hydrates | Ash |
|---------------------------|---------|---------|---------|--------------------|---------|
| | pr. ct. | pr. ct. | pr. ct. | pr. ct. | pr. ct. |
| Fruits: | | | | | |
| Apples..... | 84.6 | .4 | .5 | 14.2 | .3 |
| Bananas..... | 75.3 | 1.3 | 6 | 22. | .8 |
| Prunes, uncooked..... | 22.3 | 2.1 | ..... | 73.3 | 2.3 |
| Raisins..... | 14.6 | 2.6 | 3.3 | 76.1 | 3.4 |
| Vegetables: | | | | | |
| Beans, dried..... | 13.6 | 22.5 | 1.8 | 59.6 | 3.5 |
| Cabbage..... | 91.5 | 1.6 | .3 | 5.6 | 1.0 |
| Corn..... | 75.4 | 3.1 | 1.1 | 19.7 | .7 |
| Peas, shelled..... | 74.6 | 7.0 | .5 | 16.9 | 1.0 |
| Peas, dried..... | 9.5 | 24.6 | 1.0 | 62.0 | 2.9 |
| Potatoes, white..... | 78.3 | 2.2 | .1 | 18.4 | 1.0 |
| Tomatoes..... | 94.3 | .9 | .4 | 3.9 | .5 |
| Cereals: | | | | | |
| Bread, white..... | 35.3 | 9.2 | 1.3 | 53.1 | 1.1 |
| Cornmeal..... | 12.5 | 9.2 | 4.9 | 72.4 | 1.0 |
| Macaroni..... | 10.3 | 13.4 | .9 | 74.1 | 1.3 |
| Oats, rolled..... | 7.7 | 16.7 | 7.3 | 66.2 | 2.1 |
| Rice..... | 12.3 | 8.0 | .3 | 79.0 | .4 |
| Wheat, cracked..... | 10.1 | 11.1 | 1.7 | 75.5 | 1.6 |
| Dairy Products: | | | | | |
| Butter..... | 11.0 | 1.0 | 85.0 | ..... | 3.0 |
| Buttermilk..... | 91.0 | 3.0 | .5 | 4.8 | .7 |
| Cheese, Cheddar..... | 27.4 | 27.7 | 36.8 | 4.1 | 4.0 |
| Cream..... | 74.0 | 2.5 | 18.5 | 4.5 | .5 |
| Milk, skimmed..... | 90.5 | 3.4 | .3 | 5.1 | .7 |
| Milk, whole..... | 87.0 | 3.3 | 4.0 | 5.0 | .7 |
| Meats: | | | | | |
| Beef, round..... | 67.8 | 20.9 | 10.2 | ..... | 1.1 |
| Beef, chuck ribs..... | 62.7 | 18.5 | 18.0 | ..... | .8 |
| Veal, loin..... | 69.0 | 19.9 | 10.0 | ..... | 1.1 |
| Mutton, leg..... | 62.8 | 18.5 | 17.7 | ..... | 1.0 |
| Pork, loin chop..... | 60.0 | 20.0 | 19.0 | ..... | 1.0 |
| Ham, smoked..... | 40.2 | 16.2 | 38.8 | ..... | 4.8 |
| Bacon..... | 20.2 | 10.5 | 64.2 | ..... | 5.1 |
| Fowl..... | 63.3 | 19.3 | 16.3 | ..... | 1.1 |
| Broilers..... | 74.8 | 21.5 | 2.5 | ..... | 1.1 |
| Bass, black..... | 76.5 | 20.6 | 1.7 | ..... | 1.2 |
| Cod, salt..... | 53.5 | 21.5 | .3 | ..... | 24.7 |
| Eggs, edible portion..... | 73.7 | 14.8 | 10.5 | ..... | 1.0 |

Cereals contain protein and, when purchased in bulk, as they should be, afford a comparatively cheap supply of that nutrient. While package breakfast foods are both sanitary and palatable, they are expensive. The same nourishment can be obtained in bulk for much less money, and it would be economy to purchase them that way and provide sanitary receptacles in which to store them.

Fats

Fats include oils. Fats are solids at ordinary temperatures and oils are liquid. Fats are more concentrated fuel foods than carbohydrates and, consequently, take longer to digest. Fats produce more heat than the carbohydrates. In this respect, carbohydrates and fats might be compared with wood and coal respectively.

About 15 per cent of the weight of a person is fat. If more fat is eaten than is used for heat and energy, it is stored as body fat until it is needed. If more carbohydrates are eaten than required to produce the necessary amount of heat and energy, the surplus is transformed by the body and stored as body fat. The amount of fuel the body needs is dependent upon the amount and kind of exercise and the climate.

Fats are of both vegetable and animal origin. Olive oil, cocoanut oil, cottonseed oil, oil of corn and of wheat are derived from vegetation. Cream, butter, lard and tallow are of animal origin. A number of fats is obtained when cooking meats, poultry, etc., as beef drippings, bacon fat, chicken fat and goose oil. The price of the fats depends upon their flavor—not the fuel value—the pleasantly flavored fats and oils being higher priced. Fats are used in the preparation of most dishes. Lard, cottolene and beef tallow are used for deep fat frying.

Mineral Matter

Mineral matter is a class of nutrients which yields only a small amount of heat, if any, but it builds bony tissue, such as bone, teeth, hair and nails. It is mineral matter which enables the skeleton to keep its form. Without this, it would be soft and pliable. From 5 per cent to 6 per cent of the body is mineral matter. It is found in solution in the blood and other tissues of the body, aids in the digestion of food and helps to regulate other body processes.

Vegetables and fruits are the chief source of supply of mineral matter. It is located directly beneath their skins. Grains contain mineral matter also, but, in the process of manufacture, this is very largely lost, so that the breakfast foods and white flour contain but a very small portion of the mineral matter of the grain from which they are manufactured.

Water

Water forms 60 per cent of the body. Water is present in all the tissues of the body, but, as it does not burn, it yields no heat nor energy. About 50 per cent of all food is water. This is not sufficient, however, and in addition about four pints ought to be consumed daily. Water is a solvent and aids in digesting the food by diluting the contents of the stomach to the consistency of thick cream soup and diluting the gastric juices so that they can readily reach and act on all particles of food. By diluting the body fluids, water is the carrier of nutrition to the cells and it removes waste products from every cell in the body. On account of this circulation, the heat of the body is evenly distributed. Body heat is regulated by perspiration, and thus the body is kept at practically a constant temperature.

Water is the great cleansing agent of the interior of the body as well as of the exterior. For drinking purposes,

water must be pure. If its purity is doubted, it should be boiled and cooled.

Water is hard or soft according to the amount of mineral matter it contains. Soft water is a better solvent of dirt than hard water. Water containing lime is softened by boiling. Borax, sal soda and ammonia are used to soften water. Soap is used for the same purpose and to act upon grease, making the removal of dirt easier.

PRESERVATION OF FOOD

By making the conditions unfavorable to the growth of bacteria, we are enabled to preserve food for a period of time, the length of which depends upon the thoroughness of our efforts. Warmth, food and moisture are required for the growth of bacteria.

The object of preserving food is to have various foods when they are out of season and, consequently, are high priced. The foods are preserved in season when at their best and plentiful.

Cold Storage

Preserving food by the removal of heat checks the growth of bacteria. Freezing meats and fish or keeping them in cold storage at a temperature just above freezing preserves these foods for an indefinite time. Butter, eggs, etc., may be kept in a similar manner. They should be used at once when thawed out or removed from cold storage.

Drying

Some foods, such as fruits, berries and meat, are preserved by removing most of the moisture they contain, thus checking the growth of bacteria. Before cooking these dried foods, moisture is supplied by soaking for several hours in cold water.

Salting

Meats and fish are salted by placing them in a heavy brine. The salt solution displaces the natural juices. The food is preserved because the moisture is removed and the growth of bacteria is checked.

Smoking

Meats and fish which are to be smoked are first salted in brine for a few weeks. They are then washed and allowed to drain and dry for two or three days. When dry, the pieces are hung in a smokehouse and smoked. The smoke penetrates the meat and closes the pores to some extent, thereby excluding the air and preventing attack from bacteria and insects.

Using Preservatives

Using salt has already been discussed. A heavy syrup of granulated sugar will preserve fruits and berries. Jelly and preserves are examples when the mixtures are cooked. The principle is the same as in salting.

The chemical preservatives, usually spoken of as canning powders, are very harmful and should not be used.

Canning

Canning used to be sealing sterilized food in sterilized cans. With the cold-pack method predominant, canning is the process of sterilizing clean food materials packed in glass jars or tin cans and sealing the jars and cans when removed from the canner. See U. S. bulletins on "Boys' and Girls' Home Canning Club Work."

Packing Eggs

Select strictly fresh eggs—eggs which have been collected the day they are to be packed, and from nests from which the eggs are gathered at least twice daily. By excluding the air,

the eggs may be kept fresh for several months. Care should be taken to place the small end down, and to keep the eggs in a cool place. Methods tried and used successfully in school work are:

(1) Pack the eggs in an earthen jar of such a size as will hold the desired number of eggs. Cover them with a liquid glass solution, commonly known as "water glass." Use from eleven to twenty parts of boiled and cooled water to one part of liquid glass. Stir well and carefully pour over the eggs. Have enough to cover the eggs. Cover the jar to prevent the water from evaporating. Result: 100 per cent fresh.

(2) Wrap each egg carefully in a piece of newspaper about ten inches by eight inches. Pack in a jar or pail and cover the top of it. 100 per cent fresh.

(3) Eggs packed in salt are often difficult to remove when wanted, because the salt absorbs moisture which evaporates when there is less moisture in the air and leaves the salt hard. During this process the egg is likely to absorb moisture and flavors. 75 per cent good for cooking.

(4) and (5) Bran and sawdust are light weight materials and require large containers if they are used in packing eggs. They are not so good as the others given. 80 per cent good.

PLANNING MENUS

It is necessary to consider age, sex, climate and season of the year when planning menus. The growing child needs a large amount of protein supplying, or muscle building, foods to meet the requirements of the body. An adult at hard muscular labor requires more fuel foods and also muscle building foods to produce energy for work and to repair the waste respectively. Women, generally speaking, require about 80 per cent as much food as men. A person living in a warm

climate does not require the fuel foods that a person living in the North does. Nor does a person living in the North require so much of the heat producing foods during the very warm weather as during the cold winter months.

Meals should be planned to meet the requirements of every member of the family during the different seasons of the year. The flavors of the different dishes should harmonize. The reference books should be consulted and the menus studied carefully. Work out a balanced diet for an average working man; another for an office man. Plan a good working menu for your home family for one week. Submit it to the teacher for approval.

PURPOSE AND PRINCIPLES OF COOKING

Some foods are made more easily digested by cooking and others more difficultly. Beef and eggs are more easily digested if not cooked. When cooked, both usually are more pleasing in appearance and more palatable. Raw pork may prove harmful; but, if thoroughly cooked, it may safely be used as food, because cooking kills any germs and parasites that may be in it. Vegetables and cereals are generally more easily digested when cooked, because the cellulose, the woody fiber which incloses the starch granules, is softened and the starch granules expand and burst the cell walls. As a result, the consistency is changed to a soft, pasty mass, as cooked starch, macaroni, rice and potatoes. Some foods can be cooked or eaten raw, or cooked in different ways to develop or modify flavors.

Summed up, the purpose of cooking a food may be one or more of the following:

- To develop flavor.

- To make food more palatable.

- To make food more pleasing in appearance.

To kill germs.

To render food more easily digested.

To give variety.

Methods of Cooking

Heat is applied to the food either by means of hot water, heated air, heated metal, hot fat or a combination of some two.

Foods are cooked in hot water by the following methods:

Boiling is cooking food in enough water to cover it.

Stewing is cooking food in a small amount of water and keeping the kettle tightly covered.

Steaming is cooking food directly over the steam, or indirectly, when in a double boiler.

Foods are cooked by hot air by the following methods:

Roasting is cooking meat in a heated oven.

Baking applies more generally to bread, cake, etc., and is the same as roasting, or cooking in a heated oven.

Broiling is cooking meats directly over the fire. A special broiler is needed. For this reason, pan broiling is generally used.

Foods are cooked by hot metal by the following method:

Pan broiling is cooking food in a hot pan, turning it often.

Foods are cooked by hot fat by the following methods:

Frying is cooking food in deep fat.

Sauteing is cooking food in a small amount of fat and turning it often.

Foods are cooked in a combination of hot fat and hot water by the following method:

Fricasseeing is begun by cooking the food in a small amount of fat until browned and the flavor is well developed; then a small amount of water is added and the food stewed until tender. The cooking is completed by browning again in fat.

Foods are cooked by a combination of heated air and hot water by the following method:

Braising is browning the food in the oven, adding water and stewing in a covered pan in the oven until tender.

Combining Ingredients

There are four methods of combining ingredients:

Stirring is a circular motion and is used when mixing a dry material, as flour, with a liquid and when stirring the contents of a kettle while cooking.

Beating is a circular motion used to inclose air in a mixture, as a batter or an egg. A spoon, wire beater and Dover beater are the tools used.

Cutting is used to mix flour and shortening for pastry. One or two knives, or a fork, are used.

Folding is used when adding beaten egg white to a batter. The batter from near the bottom of the dish is carried up and over the beaten egg white, care being taken not to break up the egg white so that the enclosed air escapes.

Working Directions

See the chapter on "The Hot Lunch" for measures, abbreviations, directions for measuring, making white sauces and thickening soups. For general directions for preparing and cooking vegetables, cereals and pastes, see "Carbohydrates," this chapter. For preparation of meals, laying the table, clearing the dinner table and washing dishes, see Chapter VII. For general directions for cooking eggs and meats see "Protein," this chapter. For meat and egg dishes, see Chapter V.

BREAD MAKING

Bread is used in some form by all civilized peoples. There are two classes of bread: The quick breads, which are

leavened or made light with a leavening agent, as soda and baking powder, when carbon dioxide gas is formed rapidly, and the yeast breads, which are made light with yeast. The yeast plants give off carbon dioxide gas, but it takes longer to make dough light with yeast. because the plants must multiply.

Yeast bread, being the most wholesome and keeping best if thoroughly baked, will be considered first. The three essential ingredients of yeast bread are flour, yeast and liquid.

The important constituents of flour are starch and gluten. The quality of gluten in wheat flour makes it possible to make light bread. Gluten is elastic and strong, thus giving the carbon dioxide gas an opportunity to expand. Yeast is a dust plant which is used commercially. For bread making, active yeast is needed; i. e., yeast with strong plants. Commercially, yeast comes in cakes, as compressed yeast and dry yeast.

Compressed yeast contains more moisture and does not keep as long as dry yeast, but it contains more active yeast plants. If kept in a cool place, it will keep for a week. Starch is mixed with the yeast. Dark spots in compressed yeast indicate dead yeast plants.

In dry yeast there is cornmeal or other cereal meal. This yeast must be soaked for a long time before using. A sponge is usually made in the evening and allowed to rise until morning. Liquid, or homemade, yeast is made of flour and water, some mashed potato or potato water with some dry or compressed yeast for a starter.

Milk, water, half milk and half water and buttermilk are the liquids used. Liquid consisting of equal parts of milk and water gives the most satisfactory results. The milk should be scalded to prevent the bacteria from acting

upon the lactose, or milk sugar, changing it to lactic acid. The temperature of the liquid should be between 75 and 90 degrees F.

There are three nonessential ingredients, sugar, salt and fat. They add flavor. Sugar serves as a ready food for the yeast plant, which lives upon the starch in the flour, first changing it to sugar. Fat improves the crumb.

Yeast Bread—One-Loaf Basis

Recipe—

$\frac{1}{2}$ c milk
 $\frac{1}{2}$ c water
3 c flour or more
 $\frac{1}{4}$ c dry yeast
1 t salt
2 t sugar
1 t fat

Directions: Scald the milk.

Add the cold water. Put yeast to soak in two tablespoonfuls of lukewarm water an hour or two before making the sponge. Keep the yeast in a warm place. Dur-

ing the cold weather if flour is cold, warm it before using. Warm the bowl with warm water if earthenware is used. Pour milk and water into the bowl, add sugar, salt, fat and enough flour to make a smooth batter. Add yeast, mix thoroughly. Add more flour, enough to make two cupfuls. Beat the sponge to enclose air and make smooth by distributing the gluten evenly. Cover and wrap the bowl in a cloth to prevent its getting chilled. Early the next morning, add more flour and knead it on the moulding board until it does not stick to the hands or the board when no flour is used. Clean the bowl out carefully by rubbing it with a little flour. Sprinkle a very small amount of flour into the bowl, place in it the dough and sprinkle it very sparingly with flour. Cover and keep warm while it rises to twice its original size. Knead again to distribute the gas evenly. Form into loaves. Place in a greased bread tin. Brush the top with butter; cover lightly with a towel while the loaf rises.

If a wood or coal range is used, a fire must be started one half hour or more before the oven is wanted, in order to heat it. Test the heat of the oven with a piece of white paper. If the paper is a golden brown at the end of five minutes the oven is ready. The temperature should be highest during the first ten to fifteen minutes. The loaf will rise some and become slightly specked with brown, whereupon it will cease rising. The heat of the oven can be decreased gradually from now until the loaf is baked.

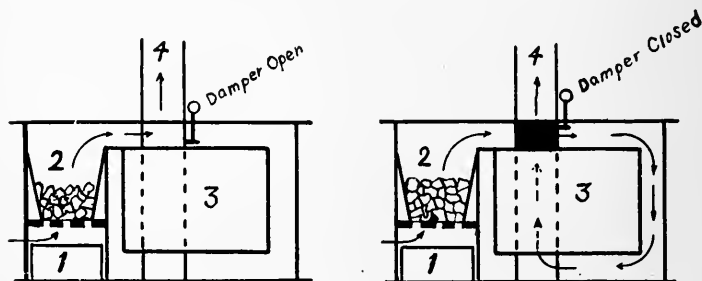


Figure 54. Diagram of stove, showing course of draft and heat when oven damper is open and when shut—1, ashpan; 2, fire-box; 3, oven; 4, stovepipe.

The time required to bake a single loaf is from fifty to sixty minutes. When baked and removed from the oven, the top crust can be brushed with milk or butter, which both softens and flavors it. Cool the bread, placing it out of a draft but so that the air can circulate around it. Have a bread box, preferably a tin box or can or an earthen crock, washed, scalded and aired, in which to store the bread when it is thoroughly cooled. The crust will be softened after being in a covered box for a few hours. Bread should not be wrapped in cloth. The bread box should be scalded and aired before fresh bread is put into it.

QUICK BREADS

Griddle Cakes with Sour Milk and Soda

Recipe—

$\frac{3}{4}$ c flour
 $\frac{3}{4}$ c of sour milk
1 T butter or
 $\frac{3}{4}$ c rich buttermilk
 $\frac{1}{4}$ t salt
 $\frac{1}{2}$ t soda

Directions: Mix and sift the dry ingredients. Add to the milk and melted butter or buttermilk in the mixing bowl. Mix and beat well. Bake on a smok-

ing hot griddle. Grease slightly for the first baking only, unless the cakes should burn; then scrape and grease. When the upper side is full of holes, and the cake shows signs of being baked more than half way through, turn and bake on the other side. Be sure that the cakes are well baked. If the milk is not thick, use more flour, about one and one half tablespoonfuls. Serve as soon as baked.

Muffins with Eggs

Recipe—

$1\frac{1}{2}$ c flour
2 T baking powder
 $\frac{1}{2}$ t salt
1 t sugar
1 c milk
1 egg
1 T melted butter

Directions: Mix and sift dry ingredients, add milk, beaten egg yolk and melted butter, beating each well in before adding the next. Fold in the beaten egg white. Bake in a hot oven

from twenty-five to thirty minutes. The heat can be decreased during the last half of the time.

Baking Powder Biscuit

Recipe—

2 c flour
4 t baking powder
 $\frac{3}{4}$ t salt
2 T butter
 $\frac{3}{4}$ to 1 c milk

Directions: Take out a rounding tablespoonful of flour and put with the baking powder. Cut the butter into the flour with two knives, held in one hand

with the forefinger between the blades just below the handles; or rub the butter into the flour with a fork, by pressing down

with the fork, so that the flour and fat pass up between the tines. When thoroughly mixed, add flour with baking powder. Mix well and add the milk, gradually, to the dry flour. Handle as little as possible. Place on floured moulding board. Use a case knife for handling dough. Roll to one inch and cut with a biscuit cutter, first dipped in flour. Place half an inch apart on a greased tin. Bake in a hot oven twenty to twenty-five minutes.

For meat pie crust, roll biscuit dough one inch thick and bake on a greased tin. There is no danger of its being doughy on the side.

Steamed Dumplings

When the ingredients for making baking powder biscuits are mixed, take the dough by spoonfuls, roll in flour and place all on a hot plate in a steamer. Steam for half an hour, then test with a pointed knife. Serve hot with stews. If covered with a cloth and kept in a warm place, dumplings can be kept hot for a reasonable length of time without spoiling.

CAKE MAKING

There are two classes of cakes—butter cakes and egg cakes, or those without butter. For butter cakes, cream the butter, add the sugar and cream until the sugar is dissolved. Add the beaten yolks to creamed butter and sugar, add flour and milk, alternately, until all of both is used. A little flour is added to the baking powder. Mix well and add to the mixture. Add the flavoring. Fold in the beaten whites. Bake on well greased tins in a hot oven until done. When baked, the cake will recede from the sides of the tin. It is well to try the cake in the center with a toothpick to see if the cake sticks. It is baked if the toothpick comes out clean. The yolk and white of one egg may be added at a time to the creamed mixture and beaten until light. Then proceed with

the remainder as directed. Bake cakes that are made without butter with moderate heat. These cakes shrink, if baked in a hot oven or too long.

Rich Butter Cake

Recipe—

3 T sugar
1½ T butter
2 T milk
¼ t baking powder
½ egg
2 or 3 drops flavoring
½ c 2 T flour

Directions: Put together as directed for butter cake. Bake in a muffin pan. This amount is enough for two cups, if they are deep.

Cheap Butter Cake

Recipe—

½ c sugar
¼ c butter
½ c milk
1 egg
1½ c flour
3 t baking powder
¼ t flavoring

Directions: Mix ingredients as directed for butter cake. Bake in a greased loaf tin. This recipe makes one layer.

Angel Food Cake

Recipe—

1 c egg white
1 c sugar
1 t cream of tartar
1 c flour
1 t almond extract or vanilla

Directions: Mix and sift sugar and flour seven or eight times. Beat eggs slightly, add cream of tartar and continue beating, using a wire whip, until

the egg whites do not slip from the dish, when it is inverted. Add flavoring. Carefully fold beaten egg white and sugar and flour mixture together. Bake in a tubed tin, which has not been greased. Bake in a slow oven for sixty minutes, or until the cake does not stick to a toothpick. When baking, keep cake covered during first half of the time.

Sponge Cake

Sponge cake is another kind of egg cake. The egg yolk is beaten until lemon colored. Add the sugar gradually; then the liquid and flavoring, and the flour. The beaten egg whites are folded in.

COOKIES

Plain Drop Cookies

Recipe—

$\frac{1}{4}$ c butter
 $\frac{1}{2}$ c sugar
 2 T milk
 1 egg
 1 t baking powder
 1 c plus 1 T flour

Directions:

Cream the butter and sugar. Add the egg and beat. Add milk. Mix baking powder with a tablespoonful of flour. Add the remainder of the

flour gradually to the mixture. Beat well. Add baking powder, and mix thoroughly. Drop by the teaspoonful about two inches apart on a greased tin. Bake in a hot oven.

Rocks

Recipe—

$1\frac{1}{4}$ c sugar
 3 eggs
 1 c butter
 $\frac{1}{4}$ c milk
 3 c flour
 3 t baking powder
 $\frac{1}{2}$ c English walnuts
 1 c raisins
 1 t cinnamon
 $\frac{1}{4}$ t cloves
 $\frac{1}{8}$ t allspice

Directions:

Cream the butter and sugar. Add the beaten yolks, milk and the dry ingredients. Flour the chopped raisins and nuts and add them to the mixture. As each ingredient or mixture of two or more is added, mix thoroughly. Fold in the beaten whites. Drop with a

teaspoon an inch apart on the greased tin. Bake fifteen minutes in a hot oven. This amount makes four dozen.

PIE MAKING.

Pie Crust

Recipe—

$\frac{1}{4}$ c fat
 1 c flour
 $\frac{1}{4}$ c cold water
 $\frac{1}{4}$ t salt
 $\frac{1}{2}$ t baking powder

Directions:

Mix ingredients as directed for biscuit. Roll out one eighth inch thick. To fit the crust to the tin, lift it with the rolling pin, and place it over

the tin. Fit the crust to it. For a double-crust pie, such as apple or mince, trim the crust even with edge of tin,

fill, dampen the edge and lift the upper crust in place, after cutting a few air-holes in it. Press the edges together with a fork, after trimming the edge as on the first. Bake pie crust in an oven that will brown a piece of white paper in three minutes. When the crust does not stick to the tin, it is baked. While it is necessary to start baking the pie in a hot oven on account of the shortening, it is necessary to decrease the heat so that the filling may cook and the crust not be overdone. When a single crust pie is being made, bake the crust first, after having built up the edge by turning the crust under about three fourths of an inch, and pressing the edges to make it stand up. Thicker pies can be made, if the edge is of uniform height.

Banana Pie

To make a banana pie, first bake a single crust. Fill with sliced and sugared bananas. Cover with whipped cream.

Prune Pie

Stew enough prunes to fill the crust. Pit the prunes and fill the crust with them. Cover with whipped cream.

SALADS

Salads are very important. By means of such dishes, vegetables, fruits, left overs of meats and fish, etc., that otherwise might be wasted, can be utilized. Lettuce and cabbage dressed with vinegar, salt and pepper, or vinegar and sugar, are simple salads. So, also, are boiled beets dressed with vinegar. Most of the green vegetables, and some fruits, are good dressed with oil and vinegar. A simple cooked egg dressing, mixed with an equal amount of whipped cream and seasoned to suit the flavor of the mixture it is to dress, can be used. Mustard is not required with a cabbage salad, as the cabbage contains mustard. Nor should sugar be used for a potato salad. Care should be taken not to make a salad mussy in appearance by stirring it.

Cooked Egg Dressing**Recipe—**

2 eggs or
4 egg yolks
 $\frac{1}{4}$ c vinegar
2 t butter

Directions: Heat the vinegar. Beat the eggs and pour the boiling vinegar slowly into the beaten egg. Return to the fire and cook slowly while stir-

ring constantly, or cook in a double boiler. Add butter when cooked. For meat and vegetable salads, season with mustard, salt and pepper. For fruit salads, season with sugar, salt and pepper.

BEVERAGES**Coffee****Recipe—**

1 T coffee
1 c water

Directions: Good coffee can be made by starting it with cold water or with boiling water. If

starting it with cold water, place the coffeepot where it will heat and when the coffee comes to a boil remove it to a cooler place where it will keep hot. Serve in five minutes. If the liquid coffee is grayish in color, it indicates that the water should be boiled before adding the coffee. The iron in hard water discolors coffee. If the water is boiling, place the coffeepot where it will keep hot for five minutes but not boil. It is as well if coffee does not boil. Be sure to serve it hot. Half an egg white to six tablespoonfuls of coffee will keep the coffee clear when making it with cold water. As the water heats, the egg white coagulates and entangles the coffee grounds. Use only a clean, aired and scalded coffeepot. Do not allow the coffee to remain long with the grounds, as they will spoil it.

Cocoa**Recipe—**

$\frac{1}{2}$ c water
 $\frac{1}{2}$ c milk
1 t cocoa
1 $\frac{1}{2}$ t sugar

Directions: Heat the water and mix the cocoa and sugar. Add some boiling water, making

a smooth paste. Pour this into the boiling water. Let it simmer for five minutes. When ready to serve, scald the milk and add it to the hot cocoa mixture. Milk is more easily digested if not boiled.

Tea

Recipe—

1 t tea
1 c boiling water

Directions: Heat the teapot with hot water. Put tea and boiling water into the teapot and

allow the tea to steep not more than five minutes, where it will keep hot but not boil. Serve hot. Use while fresh.

Lemonade

Recipe—

Juice of 2 lemons
Juice of 1 orange (medium)
 $\frac{1}{4}$ c to $\frac{1}{2}$ c sugar
3 c water, ice-cold

Directions: Dissolve the sugar in a little hot water. Chill. Cut the lemons and orange in halves. Squeeze the juice from

them. Mix juice, syrup and ice-cold water. Place a thin slice of lemon in each glass, and serve at once.

EXPERIMENTS

Soda and an Acid. Prepare a vinegar solution, two teaspoonfuls in half a glass of water. Half fill two test tubes with the solution. Drop about a sixteenth of a teaspoonful of soda into each tube. Stir it. Watch the bubbles rise. With what are they filled? Heat one tube. Watch for any change that may occur. What conclusion do you come to as to speed when making quick breads, cakes, etc.? Effect of the heat of the oven?

Baking Powder and Water. Try a similar experiment, using one quarter of a teaspoonful of baking powder in the water. Are the results similar? What is your conclusion as to the effect of moisture on baking powder? Heat?

Qualities of Gluten. Make a stiff dough, using one quarter of a cupful of water and flour. Does kneading it

change its appearance? What has occurred? Place the dough in cheesecloth or a wire strainer. Wash with running water. What color is the water? What colors the water? When thoroughly washed, is the mixture as white? What is left? Take it up in your hands and pull it. Does it have elasticity? How does this quality help to make light bread?

REFERENCES FOR DOMESTIC SCIENCE

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Farmers' Bulletins, Department of Agriculture, Washington, D. C.: Meats, Composition and Cooking, No. 34; Facts About Milk, No. 42; Care of Milk on the Farm, No. 63; Milk as Food, No. 74; Bread and Bread Making, No. 112; Beans, Peas and Other Legumes, No. 121; Eggs and Their Uses as Food, No. 128; Principles of Nutrition, No. 142; Cereal Breakfast Foods, No. 249; Preparation of Vegetables for the Table, No. 256; Use of Fruit as Foods, No. 293.

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CHAPTER V

THE HOT LUNCH

So many ridiculous questions have been asked and statements made regarding the hot lunches served in schools that it is well to ask, What is the "hot lunch idea"? In the first place, it is not serving lunches between meals during the forenoon and afternoon sessions of school, as some have imagined. Neither is it giving a course in domestic science. The hot lunch idea is a simple question of practical hygiene. Farmers are careful of their feed for cows, and many farmers have heaters to warm the water for their cows to drink in cold weather, moved by no other consideration than financial profit. They know that the cows produce more butter fat under these conditions. Even heaters for cooking the hog feed in winter are employed as a matter of business economy. And yet some of these same thrifty farmers will let their children walk two or three miles through snow and cold to school, eat a frozen lunch at noon, unless by good fortune it has thawed out, and trudge home again at night in time to do the chores before supper.

The primary purpose of serving something hot at noon to those who carry lunches is, then, simply one of efficiency. Like the food for the cattle and hogs, the hot lunch has been found profitable, profitable from the standpoint of educational efficiency as well as physical betterment. The boy or girl who eats only a cold lunch day after day is not physically or mentally capable of doing the work that may be expected of them.

Other advantages of the hot lunch plan are that the older students have an opportunity to do some practical plain cooking occasionally, without interfering with their

school work. The assuming of responsibility for preparing the hot dish to be served, the practice of serving and of table etiquette, and the study of food principles, are all valuable training. It should not be thought for a moment that the whole meal is prepared at school. The children bring their lunches from home. One hot dish is prepared for all the students each day during the cold weather. Even if this were nothing but a hot drink of milk or cocoa, it would be well worth while, but it is entirely unnecessary to limit the dishes that can be served to a few of which the children will soon tire. The kinds of prepared food which one can carry in a lunch basket are limited. The hot dish gives a variety and increases the nutritive value of the lunch.

The equipment for serving hot lunches need not be extensive. A cupboard with doors, made by the older boys of the school, provides a place for dishes, cooking utensils and supplies. The one shown in the picture is similar to several others that were made out of dry goods boxes.

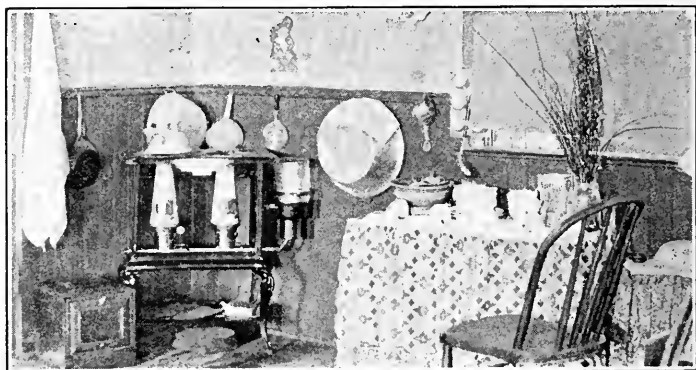


Figure 55. Equipment for the hot lunch. Photograph taken in a rural school. Note the improvised cupboard made out of a dry goods box and covered with curtain.

Shelves were put in and curtains hung over the front. Doors would be more sanitary than curtains, however. Each child is asked to bring a cup, saucer, fork and spoon. These utensils remain during the hot lunch season, from November to April. It is also desirable, but not necessary, that each child bring two napkins—one to be used as a tablecloth on the desk. Paper napkins may be purchased out of a general fund, if desirable. Linen ones should be washed as often as necessary or exchanged for clean ones at home. Coffee cans or fruit jars can be obtained in which to keep the staple supplies, as flour, sugar, salt, oatmeal, cornmeal, rice, etc.

The question of supplies is often raised. How are the materials used by the students obtained? Sometimes a levy of ten cents each is made for the purchase of groceries. We have found a more satisfactory way in which the students bring practically all the supplies from home. This is not difficult, as they can furnish large or small quantities—a quart of milk or one cupful, one potato or half a dozen. If a soup or some dish requiring milk is made, it is well to let one family furnish all that is needed for that day. It will not bring anything more until its turn comes again. This matter can easily be regulated by the teacher, and a record kept. If baked potatoes were the dish to be served, each child could select from home a potato and bring it to school the day it is to be used. A few cents each will provide the general supplies referred to above, or even they may be brought from the homes. There will be no difficulty in getting all the supplies, if the teacher is tactful and has the co-operation of the mothers. There may be home conditions in the community where it would be wise to have the children from some homes bring only vegetables. Other families could furnish the milk, butter, eggs, meal, etc. Plans

should be made and the dish selected two or three days before it is to be served. As far as possible let the students make the selections. Two or three can be suggested by the teacher and one chosen. Change enough should be made to vary the nutrients from day to day.

Housekeepers, or monitors, should be selected from the older boys and girls to serve for one week. Two are enough at once. In case the school is large, one or two more may be selected to help serve and to wash the dishes. These students are responsible, but the teacher should assist and encourage them. The necessary preparations are made in the morning before school and at recess. One of the housekeepers can quietly get up and start the stove at whatever time the dish needs to be put on to have it ready by noon. The rest of the students will soon pay no more attention to this than to any other schoolroom activity to which they are accustomed. Little, if any, time needs to be taken to watch the heating or cooking process.

As soon as dismissed, the pupils should take their seats for lunch. The monitors should then pass the napkins, the spoons or forks, and the dinner pails from home. The hot dish made in school is then served to each, and eaten with the lunch from the pails. The teacher should always sit and eat with the pupils. Encourage pleasant conversation. Sometimes she could have them discuss what they have for lunch and its uses. Nutrition, balanced diets, sanitation, good health, games for the playground, are suggestive topics for conversation. Table manners such as are found in the best homes should prevail. At least twenty minutes should be used in eating the noon lunch, and, if persons leave before that time, they should ask to be excused, as at any other table. Lunch plans for the next day are made. The lessons

to be learned from these sources are well worth the little extra work required to conduct the hot lunches.

Dishwashing follows the lunch, and is done by the housekeepers, changing each week. The water should be heated for this while the lunch is being eaten. The monitors remove the dishes, but each student is responsible for the crumbs near his desk. The dishes are washed, rinsed, wiped and put in their proper places in the cupboard. See that the mixing dishes are kept very clean. As soon as students get used to the routine of preparing, serving and dishwashing, very little time will be consumed in these tasks. The boys should take their turns as well as the girls. The experience will be valuable to them also.

The equipment here given is regarded as suitable and sufficient. It costs less than ten dollars and will last for years. The equipment may be used for farmers' club meetings, institutes, and other social gatherings at the school. Any live school can raise enough money to purchase the outfit if it is not furnished by the district.

THE EQUIPMENT

| | |
|--|-------------------------------------|
| 1 double burner blue flame kerosene stove. | 1 cover to fit. |
| 1 single burner oven. | 1 wooden mixing spoon. |
| 1 twelve-quart dish pan. | 1 ladle. |
| 1 draining pan. | 1 tablespoon (metal). |
| 1 set of six muffin tins. | 1 teaspoon (metal). |
| 1 three-pint mixing bowl. | 1 kitchen knife. |
| 1 small bowl. | 1 fork. |
| 1 cup (St. Dennis). | 1 Dover egg beater. |
| 1 dinner plate. | 1 strainer. |
| 2 pie tins (1 large, 1 small). | 1 paring knife. |
| 2 asbestos mats. | 1 case knife. |
| 1 eight-quart granite kettle. | 1 graduated measuring cup. |
| | 1 eight-inch omelet pan or skillet. |

GENERAL DIRECTIONS

Use level measures for both dry and liquid materials. If you wish to measure a spoonful of flour, dip a spoon into

the flour and level off with the back of a case knife. Starting at the handle, push the surplus off as the knife moves toward the end of the spoon. Fill a cup or large measure by lifting the material into it with a spoon or dish, then level off with a case knife. Filling a measure by dipping it into the dry material causes the material to pack. Always look up the table of measures when using a recipe from a new book. Abbreviations, measures and weights that will be used in carrying out the hot lunch idea are here given.

Abbreviations

t = teaspoonful; T = tablespoonful; c = cupful; pt. = pint;
qt. = quart; lb. = pound.

Measures

4 teaspoonfuls make 1 tablespoonful; 16 tablespoonfuls make 1 cupful; 12 tablespoonfuls of dry materials, as rice and rolled oats, make 1 cupful; 2 cupfuls make one pint; 2 pints make 1 quart; 4 quarts make 1 gallon.

SAUCES AND THICKENING FOR CREAM SOUPS

Thin Sauce

1 T of fat
1 T of flour
1 c of milk (usually)
 $\frac{1}{4}$ t of salt
A dash of white pepper

Medium Sauce

2 T of fat
2 T of flour
1 c of milk or other liquid
 $\frac{1}{4}$ t of salt
A dash of white pepper

Methods of Making Sauces or Thickening Liquids

1. Use this method when all ingredients are cold and time must be considered. Place the flour and fat in a pan over the fire. Stir with a wooden spoon as the butter melts, and do not allow it to burn. A wooden spoon is acid-proof, noiseless and does not become hot. When frothy, add the liquid. Stir constantly and rapidly while the sauce cooks. It is cooked when it does not taste of raw flour. Season.

2. Use this method when liquid to be thickened is warm. Mix the flour and fat in a cup or bowl. With the

knife place the mixture of flour and fat on the end of wooden spoon and stir it into the liquid. It is cooked when it does not taste of raw flour. Season.

3. Use this method when a small amount of fat is used. To the flour add enough of the cold liquid to make a smooth batter. Pour the batter into the boiling liquid. It is cooked when it does not taste of raw flour. Add fat and seasoning.

Sauces and cream soups must be smooth and not lumpy. Should either show signs of lumping, remove from the fire immediately and beat the mixture with the Dover beater until smooth. Return to the fire, stirring constantly and cook until done. The thin sauce is suitable for creamed potatoes, macaroni, toast and rice. The medium sauce is used with vegetables less starchy than potatoes, and with fish. A cupful of sauce is needed for a pint of diced vegetables when preparing a creamed dish. The medium sauce is also used in making creamed soups. An equal amount of the liquid in which the vegetable is cooked is added to the sauce. In some cases the vegetables are pressed through a sieve and added. Sauces can be kept warm, if covered tight and placed in a pan of hot water.

SUGGESTIVE DISHES FOR HOT LUNCHES

Fifty dishes that have been prepared and served in rural schools are given. Select from them.

Note: The time for each recipe is an estimate of the time required to cook it with reasonably good heat, not to prepare it. Salt is added as directed in cooking cereals and vegetables when boiling either. Sauces are seasoned except when otherwise directed, as in creamed chipped beef. If recipes requiring a long time are chosen, there should be some place to heat them on the regular stove to save oil. A homemade fireless cooker should be used if possible as it will save both time and fuel. Where an oil stove only can be used, do not select the recipes that require more than a short time.

Carbohydrates and protein are discussed as fully as space will permit in Chapter IV. This discussion should be con-

sulted frequently for the preparation of vegetables, cereals and other foods used in the laboratory work in preparing hot lunch dishes.

VEGETABLES

1—Baked Potatoes. Time: 1¼ hours.

Recipe—

1 medium sized potato
per pupil

Directions: Wash and put potatoes to bake on grate in hot oven an hour and fifteen minutes

before time to serve. Turn potatoes occasionally while baking. They are baked, if they feel soft when pressed between the hands. If not ready to serve at once, burst or prick with fork the skin of each potato, so that the steam may escape. Otherwise the potatoes become soggy. Place in a clean towel to keep warm.

2—Mashed Potatoes. Time: 45 minutes

Recipe—

6 medium sized potatoes
¾ c hot milk
2 T butter
¼ t salt
¼ t white pepper

Directions: Prepare and cook as directed for vegetables. Cut in halves only. Potatoes usually cook in thirty minutes. When tender, drain well, cover with

several thicknesses of cloth and let stand for a minute or two to allow some of the steam to escape. In the meantime put the milk on to heat. Mash smooth with a wooden potato masher. Add butter, salt, and pepper and enough of the hot milk to make light. Beat until white. This amount will serve eight to ten pupils.

3—Creamed Potatoes. Time: 45 minutes.

Recipe—

4 medium potatoes
1 c milk
1 T fat
1 T flour
1¼ t salt
Pepper

Directions: Make a thin sauce of milk, fat, and flour and add a pint of boiled diced potatoes. See sauces and cooking vegetables. Enough to serve four pupils.

4—Scalloped Potatoes. Time: 1¼ hours.**Recipe—**

4 medium potatoes
1½ c milk
1 T salt
1 T butter
2 T flour
Pepper to taste

Directions: Wash, pare and

cut potatoes in one eighth inch slices into a buttered baking dish.

On each layer of potatoes sprinkle flour, salt, and pepper, and dot

with bits of butter. Continue until all are used. Pour hot milk over the potatoes, but not enough to cover the top layers. Place in a hot oven and bake, covered for the first half hour, but uncover to allow to brown. Bake for another half hour or until tender when tried. Add more milk, if the potatoes appear dry. Serve hot. This amount will serve six pupils.

5—Mashed Turnips. Time: 2 hours.**Recipe—**

1 medium sized turnip
½ c hot milk
1 T butter
1-16 t pepper
Salt to taste

Directions: Prepare and cook

the turnip as for the other vegetables. Mash. Add milk, butter and pepper. This amount will serve five or six pupils.

6—Buttered Beets. Time: 3 to 4 hours.**Recipe—**

1½ c diced beets
1 T butter
¼ c salt
A dash of pepper

Directions: Wash and put

beets to cook with skins. Do not cut the roots of beets, because in the process of cooking

they bleed too much and spoil the color and flavor. Boil from two to four hours. It is wise to wash the beets, and put the required amount of water in kettle the day before. Whoever tends the fire can put the kettle on, so that the beets can be put on about eight o'clock. Keep them boiling continually. When tender, drain and cover with cold water for a minute or two. Drain again. Remove skins. Dice, add butter, salt and pepper. Two medium sized

beets diced amount to about one and one half cupfuls. This amount is enough to serve three pupils.

7—Baked Hubbard Squash. Time: 1½ hours.

Recipe—

One piece of squash about
4½ inches by 2½ inches
for each person

Directions: Wash and dry.

Cut the squash into halves, remove the seeds and stringy portion, cut into pieces and place in hot oven either in a pan or on grate of oven. If the oven does not bake evenly, change pieces around. After an hour sprinkle with salt, and bake another half hour. Serve hot with butter, salt and pepper.

8—Stewed Tomatoes. Time: 15 minutes.

Recipe—

1 qt. tomato
1½ c to 2 c bread or
1 c soda crackers
2 T butter
¾ t salt
Pepper to taste

Directions: Heat tomato, add butter, salt, pepper and bread or crackers. Break slices of stale bread or crackers into half-inch pieces. Serve hot. This amount

will serve ten to twelve pupils.

9—Scalloped Corn. Time: 35 minutes.

Recipe—

1 can of corn
1 c medium white sauce
1½ T sugar
¼ t salt
3 T butter
¾ c bread crumbs

Directions: To the seasoned medium white sauce add corn, sugar and salt. Butter the baking dish. Cover the bottom with a layer of corn and sauce.

Cover this with a layer of buttered bread crumbs. Use stale bread crumbs. Place butter and crumbs in pan on stove, and stir until butter is melted. Continue until all is used. Have crumbs over the top. Bake in a medium oven for twenty-five minutes. This amount will serve eight pupils.

10—Creamed Cabbage. Time: 1 hour.

Recipe—

1 c medium sauce
1 qt. cabbage

Directions: Prepare cabbage and cook in just enough water to cover. Toward the last allow

the water to boil down to about one half a cupful. Pour

cabbage and liquid into sauce. Add more seasoning, if required. This amount will serve six to eight pupils.

11—Creamed Cabbage with Cheese. Time: 1 hour.

Recipe—

1 qt. cabbage
1 c medium sauce
 $\frac{1}{4}$ to $\frac{1}{2}$ c grated cheese

Directions: Prepare and cook

the cabbage as in Number 10.

Make sauce and to it add the grated cheese. Use stale cheese, as it is more easily grated. This amount will serve six to eight pupils.

12—Creamed Carrots. Time: 30 minutes.

Recipe—

1 pt. diced carrots
1 c medium sauce
 $\frac{1}{4}$ t sugar

Directions: Prepare carrots as

directed for vegetables. Cook for thirty minutes in just enough

boiling water to cover. Allow the water to boil down toward the last. Turn carrots and the liquid they are cooked in into the white sauce. Add sugar. Serve. This amount will serve five pupils.

13—Creamed Peas. Time: 30 minutes.

Recipe—

1 pt. canned peas
1 pt. medium sauce
 $\frac{1}{2}$ t salt
1-16 t pepper
 $1\frac{1}{2}$ t sugar

Directions: At least an hour

before using the peas open and empty the can at once. While making the sauce according to directions for sauces, allow the

peas to heat. Add the salt, sugar and pepper to peas. Pour the peas into white sauce. Mix and serve hot. This amount will serve eight pupils.

14—Creamed Corn. Time: 20 minutes.

Recipe—

1 pt. canned corn
1 pt. thin sauce
1 t sugar
Salt and pepper

Directions: Make a thin white

sauce by first method as directed in sauces. Open a can of corn and empty it an hour before

time to use. To do so will improve the flavor. Heat the corn, if necessary, and add a little water to keep from burn-

ing. Pour the corn into sauce, add sugar, and salt, and pepper to taste. This amount will serve eight or nine pupils.

15—Baked Beans. Time: 10 to 12 hours

Recipe—

1 pt. beans
3 t salt
 $\frac{1}{4}$ t soda
1 t sugar
2 slices salt pork
1 t molasses (scant)

Directions: Pick over beans,

if necessary, and soak over night in two or three times as much water. In the morning put to cook in cold water to cover, add-

ing two teaspoonfuls of salt and the soda. Let boil ten minutes, drain, rinse with cold water and drain again. Cut pork, about one quarter of a pound, into half-inch cubes. Put part of pork in the bottom of the jar and the balance nearer the top after most of the beans are in the jar, add sugar, molasses and salt, unless pork is very salty. Cover with boiling water. Bake in a slow oven the balance of the day, and from early next morning continue baking them until noon. A regular bean pot or crock with a plate to cover it is used. Cook covered and the last half hour, uncover to brown. Beans should cook slowly from ten to twelve hours. If all the water is absorbed before they are cooked, add boiling water, but not enough to cover. This amount will serve eight to ten pupils.

CEREALS

16—Rice Gruel. Time: 1½ hours.

Recipe—

1 T rice
 $2\frac{1}{2}$ c boiling water
1 c of milk
 $\frac{1}{8}$ t of salt (scant)

Directions: When washed,

cook the rice as directed for cereals. After the first ten minutes, cook covered in improvised

double boiler for one and one half hours. About fifteen or twenty minutes before the time to serve add the milk, and cover. Leave pan or kettle containing gruel in pan of boiling water. Add salt and serve hot. This amount will serve one and one half pupils.

17—Boiled Rice with Butter. Time: 2 to 3 hours.**Recipe—**

1 c rice
1 T salt
4 c water

Directions: Clean, wash, and

drop rice into boiling salted water. Cook for two or three

hours as directed for cereals. If steam escapes, more boiling water must be added, if rice tasted raw when cooked dry. Serve with butter, salt and pepper. This amount will serve eight pupils.

18—Boiled Rice. Time: 2 to 3 hours.**Recipe—**

1 qt. milk
1 c rice
1 T salt
4 c boiling water

Directions: Cook as directed

in Number 17. Heat the milk a little or just keep it in the room so that it will not be cold. Keep

it covered to protect it from dust. Serve rice hot with milk and sugar. This amount will serve eight to ten pupils.

19—Steamed Rice with Raisins, Milk and Sugar. Time: 2 to 3 hours.**Recipe—**

1 c rice
3 c boiling water
1 qt. milk
1 T salt
1 T sugar
 $\frac{1}{2}$ c raisins

Directions: Cook the rice for

ten minutes, using three cupfuls of salted water, then add sugar and one cupful of milk and cook for two or three hours as directed

for cereals. Serve with milk and sugar. This amount will serve nine or ten pupils.

20—Macaroni with Tomato Sauce. Time: 2 hours.**Recipe—**

$\frac{1}{2}$ pkg. macaroni
1 c strained tomato
1 T flour
1 T butter
 $\frac{1}{4}$ t salt
A dash of pepper

Directions: Cook macaroni

as in Number 21. With strained tomato, flour and butter make a sauce and season it as directed for sauces. Pour the macaroni

into sauce, heat for a minute or two so that macaroni will be hot. Serve. This amount will serve seven or eight pupils.

21—Creamed Macaroni with Cheese. Time: 2 hours.**Recipe—**

$\frac{1}{2}$ pkg. macaroni
1 c milk
1 T butter
1 T flour
 $\frac{1}{4}$ t salt
A dash of white pepper
 $\frac{1}{2}$ c grated cheese

Directions: Break the macaroni into one and one half inch lengths. Cook same as rice, in two and one half quarts of boiling water to which two and one half tablespoonfuls of salt have been

added. Cook for two hours. Drain well, and cover with cold water and drain again. Make white sauce with the flour, fat and milk. Season, add grated cheese and macaroni. Cover and place in pan of hot water to keep hot. This amount is enough for seven or eight pupils.

22—Cornmeal Mush. Time: 3 hours.**Recipe—**

$1\frac{1}{2}$ qts. milk
3 c boiling water
1 c cold water or
1 c milk
1 c cornmeal
1 t salt

Directions: Pour boiling water into kettle. Put salt into it. Make the cornmeal and cold water or the cornmeal and milk into a smooth batter. Stir while

pouring this into the boiling salted water. Continue cooking it for two or three hours as directed for cereals. Serve with milk and sugar. This amount will serve ten or twelve pupils.

23—Oatmeal Mush. Time: 6 to 10 hours.**Recipe—**

3 c milk
1 c rolled oats
3 c boiling water
 $1\frac{1}{2}$ T salt

Directions: Cook as directed in cooking cereals. Start cooking at noon of the preceding day. Cook during afternoon. Set ves-

sel where it will keep warm over night and continue cooking the following forenoon. Serve with milk and sugar. This amount will serve six to eight pupils.

24—Rolled Oats with Dates or Bananas. Time: 4 to 7 hours.**Recipe—**

Cooked rolled oats as in
Number 23
 $\frac{3}{4}$ c pitted dates or
3 bananas
3 c milk

Directions: Cook rolled oats

as directed in Number 23.

Shortly before serving add the
dates which are best cut in
fourths. Serve with milk and

sugar. If bananas are used, peel, slice into a dish and
sprinkle with sugar to prevent discoloration. Cover dish
until ready to serve. To each service of rolled oats add two
tablespoonfuls of bananas.

SOUPS AND BEVERAGES**25—Barley Soup. Time: 10 to 12 hours.****Recipe—**

$\frac{1}{2}$ c pearl barley
3 c boiling water
1 t salt

Directions: Cook the barley

ten to twelve hours according to
directions for cooking cereals.

Add barley to reheated broth from Number 26 or other
broth made for that purpose. This amount is enough for
eight pupils.

26—Beef Broth. Time: 4 to 5 hours.**Recipe—**

4 lbs. raw meat and bone
4 qts. cold water
2 t salt
9 peppercorns
3 T each of diced onions,
carrots, parsnips and
rutabagas
4 T bacon fat

Directions: Make broth the

day before serving. Bone con-
tains nourishment and flavor
which improves the soup. A
shin or shank of beef (often spok-
en of as a soup bone) containing
equal amounts of lean meat and

bone is best. Saw bone, and cut meat into small pieces.
Put bone, meat and cold water into a kettle with a tight
fitting cover. The water ought to cover the meat and the
bone one inch deep. Add one half of the salt, the pepper-
corns, and, if desired, one third that amount of whole all-
spice. Heat contents of kettle slowly and simmer four

or more hours. In some hot bacon fat in a spider cook the diced vegetables until brown. Put browned vegetables in soup kettle, also the small amount of water with which the spider is rinsed. Add remainder of salt. Simmer half an hour. The browned vegetables are used to add flavor and color to the broth. Pour broth through a strainer into large bowl or pan. Place bone, meat, and vegetables in other utensils. After rinsing kettle, pour broth into it. Cover kettle with cloth to keep dust out and let broth cool. There will be about three quarts of stock or broth. The next day remove fat from the top and reheat. Serve each pupil with one half or three fourths cupful of broth. Cover meat with a clean cloth to keep the dust out and keep in a cool place until it is used.

27—Beef Broth with Rice. Time: 4 to 5 hours.

Recipe—

2 t rice
 $\frac{1}{4}$ t salt
 1 c boiling water
 1 c of meat stock

Directions: Prepare soup

stock as directed in Number 26.

Cook rice for two or three hours in boiling salted water, as directed

in cooking cereals. When cooked, drain well and add to soup stock. This amount will serve two pupils.

28—Cream of Cabbage. Time: 1 hour.

Recipe—

1 c thin sauce
 1 pt. cabbage

Directions: Remove the wilt-

ed or very green leaves from the cabbage. Cut into medium-sized

pieces enough to fill a pint measure or a cup twice. Wash and put to cook as directed for vegetables. Cook uncovered for one hour. Add enough water to liquid in which the cabbage is cooked to make one cupful and pour it into the white sauce. Serve hot. This amount serves four pupils.

29—Pea Soup. Time: 10 to 12 hours.**Recipe—**

1 c dry peas
1 slice salt pork
5 c water
 $\frac{1}{8}$ t soda
2 t salt

Directions: If necessary pick

over. Soak in one quart of water over night. In the morning place peas, soda, and one teaspoonful of salt in kettle with

enough cold water to cover. Boil for ten minutes, drain, rinse and drain again. Add pork cut in half-inch cubes, one teaspoonful of salt and five cupfuls of cold water, cover and allow to simmer all day and the next forenoon. If too strong, add more water about half an hour before lunch time. Season with salt and pepper to taste. This amount is enough to serve a dozen pupils.

30—Cream of Celery. Time: 40 minutes.**Recipe—**

$1\frac{1}{4}$ c of celery
 $1\frac{1}{4}$ c boiling water
 $\frac{1}{4}$ t salt
1 c medium sauce

Directions: Cut into inch

pieces the coarse parts of celery after it has been thoroughly cleaned. Put to cook in boiling

salted water. Keep covered with water, and boil until tender, about thirty minutes. Press through a sieve, add enough boiling water to pulp, and of liquid to make one and one half cupfuls. Combine with sauce. Serve hot. This amount will serve five pupils.

31—Vermicelli Soup. Time: 4 to 5 hours.**Recipe—**

1 qt. meat stock
 $\frac{1}{4}$ c vermicelli
 $\frac{1}{4}$ t salt
1 c boiling water

Directions: Make required

amount of meat stock, as directed in Number 26. Break vermicelli into inch lengths and cook for

one and one half hours in salty water. Drain. Cover with cold water, drain again, and place in broth. Serve hot.

32—Vegetable Soup. Time: 25 minutes.**Recipe—**

Onions
Carrots
Parsnips
Rutabagas

Directions: Use vegetables in equal amounts or lessen or omit any not desired. Prepare and cook as directed for vegetables.

Allow half a cupful of diced vegetables to a pupil. To soup stock left from Number 26, add from one third to one half as much vegetable stock, the liquid in which the vegetables are cooked. Serve hot. Three quarters of a cupful to a pupil.

33—Cream of Peas. Time: 30 minutes.**Recipe—**

1 pt. canned peas
 $1\frac{1}{2}$ t salt
3 c boiling water
3 c medium white sauce
Pepper to taste

Directions: An hour before they are wanted, open and empty at once a can of peas. Mash the peas. Add the boiling water

and salt. Make the white sauce according to directions in thickening sauces for soups. Combine mashed peas and sauce immediately before serving. This amount will serve ten to twelve pupils.

34—Bean Soup. Time: 10 to 12 hours.

See Pea Soup, Number 29. Use the same amounts and make in the same way.

35—Cream of Tomato Soup. Time: 15 minutes.**Recipe—**

$\frac{1}{4}$ c strained tomato
 $\frac{1}{2}$ c milk
2 t butter
3 t flour
 $\frac{1}{8}$ t salt
A dash of white pepper

Directions: Thicken the milk with flour and butter and add seasoning. Heat tomato and add enough soda so that the milk does not curdle when small amounts

of each are combined. When ready to serve pour heated tomato into the thickened milk. Stir while pouring. This amount will serve one pupil.

36—Hot Milk and Bread. Time: 5 minutes.**Recipe—**

Allow $\frac{3}{4}$ c to 1 c a person
Each pupil brings two or
more slices of bread

over the top. Serve at once. Pupils break the bread into it.

Directions: Heat the milk in double boiler or an improvised one, until a thin tissue forms

37—Cocoa. Time: 10 minutes.**Recipe—**

$\frac{1}{2}$ c water
1 t cocoa
 $1\frac{1}{2}$ t sugar
 $\frac{1}{2}$ c milk

Directions: Heat the water and mix the cocoa and sugar. Add some boiling water, making a smooth paste. Pour this into

the boiling water. Let it simmer for five minutes. When ready to serve, scald the milk and add it to the hot cocoa mixture. Milk is more easily digested if not boiled. To preserve the color of the cocoa, acid-proof utensils must be used. This amount will serve one and one third pupils.

MEATS**38—Meat Loaf. Time: 25 minutes.****Recipe—**

2 lbs. beef
2 slices salt pork or bacon
 $\frac{1}{2}$ dozen crackers
2 large or 3 small eggs
 $\frac{1}{8}$ t pepper

Directions: Use the meat from Number 26. Chop it and the salt pork or bacon, add the crackers, crumbled fine, the salt

and pepper, and mix well. Moisten with left-over soup stock or a little hot water and butter, and add well beaten eggs. Shape into a loaf in greased baking pan. Bake until the egg is cooked. This amount will serve fifteen to eighteen pupils.

39—Beef Stew. Time: 3 to 4 hours.**Recipe—**

4 lbs. beef ribs
2 qts. water
 $1\frac{1}{2}$ t salt
 $\frac{1}{2}$ c flour
5 t bacon fat
 $\frac{1}{2}$ c each of diced onions,
carrots, parsnips, turnips,
potatoes
6 peppercorns

Directions: Start to stew early in the morning. Proceed as for beef broth, brown part of meat before stewing it, and keep tightly covered. Brown all the vegetables, add them and cook fifteen or twenty minutes more.

Thicken with flour, using the third method of making sauces and thickening soups.

40—Meat with Tomato Sauce. Time: 25 minutes.

Recipe—

1 c meat packed
1 c strained tomato
1 t butter
1 t flour
 $\frac{1}{4}$ t salt
Pepper to taste

Directions: Make a sauce

with the tomato, flour and butter, add seasoning and boiled meat from Number 26, and cut into small pieces. Cook until

meat is heated, stirring occasionally to prevent from burning. This amount will serve six to eight pupils.

41—Creamed Chipped Beef. Time: 15 minutes.

Recipe—

1 c medium sauce not salted
 $\frac{1}{2}$ c chipped beef (packed)

Directions: Cut beef into

small pieces, put it into a small dish that will stand being heated.

Cover with cold water and heat slowly. When hot, the meat will have soaked up half of the water. Make sauce as directed for sauce, but omit the salt. Pour the meat and water in which it has soaked into the white sauce. Add salt, if required. This amount will serve ten pupils. If desired, serve creamed chipped beef with boiled rice as prepared in Number 17.

42—Chop Suey. Time: 1 $\frac{1}{4}$ hours.

Recipe—

2 lbs. beef
1 pkg. spaghetti
1 pt. strained tomato
2 t butter or bacon fat
 $\frac{1}{4}$ t salt
 $\frac{1}{8}$ t pepper.
 $\frac{1}{8}$ t celery seed

Directions: Cook spaghetti

the same as vermicelli in Number 31 and put it into the smoking hot fat in spider and brown it. Add the tomato and seasoning. Boil for two or three minutes.

Serve hot. This amount will serve eighteen or twenty pupils.

EGGS

43—Creamed Eggs. Time: 5 minutes.

Recipe—

1 egg
 $\frac{1}{4}$ c white sauce

Directions: Each pupil should bring a hard-boiled egg. Prepare

enough white sauce to serve all, allowing one fourth of a cupful for each pupil.

44—Soft-Cooked Eggs. Time: 8 to 10 minutes.

Recipe—

1 egg
1 c water

Directions: Place eggs in pan of boiling water, allowing one cupful to an egg. Cover and let

stand where there is but little heat for eight or ten minutes, depending on how soft they are desired. Remove and cover with cold water for a second. Serve at once.

45—Scrambled Eggs. Time: 3 minutes.

Recipe—

1 egg
1 t hot milk or hot water
1 t bacon fat or butter

Directions: Break the required number of eggs into dish and beat until yolks and whites

are well mixed. Stir while adding hot water or milk. Place one teaspoonful of bacon fat or butter in upper part of double boiler, the lower part being one third full of boiling water. When fat is hot, pour in egg mixture. As the egg cooks near the bottom and sides of pan, stir mixture. When cooked, the egg will be of a soft creamy texture. Allow one egg to a person.

46—Egg Gruel. Time: 10 minutes.

Recipe—

1 egg
1 c milk
1-16 t salt

Directions: Beat the egg while milk is heating. When steaming hot, not boiling, pour slowly over

beaten egg. Continue beating while pouring. Serve at once. This amount will serve two pupils.

47—Steamed Soft Custard. Time: 20 to 30 minutes.

Recipe—

1 egg
1 c scalded milk
1 t sugar
1-16 t salt

Directions: Beat egg in a bowl until the yolk and white are thoroughly mixed, and add the sugar. Stir while adding the

scalded milk. Pour mixture into a pail with tight fitting cover or upper part of a double boiler, and place it in a pan

of boiling water. Keep water hot, but not boiling. Allow to cook until you have a smooth custard that will cut with a knife and not stick to it. This amount will require cooking from twenty to thirty minutes. For a larger quantity a longer time would be necessary. This will serve two pupils

48—Baked Custard. Time: 25 to 30 minutes.

Recipe—

1 c milk
1 egg
1 t sugar
1-16 t salt (scant)

Directions: Combine the same

as in Number 47. Pour into the teacups and place them in a pan of boiling water. Place pan in

very slow oven. Bake thirty minutes or until the point of a paring knife will cut it and come out clean. This amount will serve two pupils.

FRUITS

Various fruit dishes may easily be prepared. Apple sauce can be made quickly, each student contributing one or more apples. Dried fruits, such as apples, prunes, apricots, etc., will require only a small amount of time in preparation and are very palatable served hot with cold lunches.

49—Baked Apples. Time: 1½ hours.

Directions: Bake one apple for each pupil. Wash and core. Place in a granite pan, put a teaspoonful of sugar in the center of each apple and pour enough water into the dish to cover the bottom of it. Bake until tender. Apples are best if baked in a very slow oven for one and one half hour.

50—Apple Tapioca Pudding. Time: 1½ hours.

Recipe—

1 c tapioca
10 tart apples
1 c sugar
Juice of 1 lemon

Directions: Soak tapioca over

night in six cupfuls of cold water. Pare, core and quarter the apples.

Add the apples, sugar and lemon

juice to the tapioca when it has cooked for fifty minutes. Cook until apples are tender. Serve with cream. This amount will serve sixteen to eighteen pupils.

CHAPTER VI

INDUSTRIAL CLUB WORK

Garden and canning clubs have been organized in nearly every state in the Union. The Federal Government has assisted the movement by sending experts to various parts of the country and state departments of agriculture have co-operated through their extension work. Mr. T. A. Erickson, state leader of boys' and girls' club work for Minnesota, gives five reasons why every school district should have one or more of these clubs. They are well worth considering.

1. To bring the school, home and farm into closer co-operation.

2. To encourage boys and girls to assist their mothers in having a good supply of vegetables and fruit for the table, thus helping to reduce the cost of living, and to teach boys and girls how to save what is often otherwise wasted.

3. To interest the boys and girls in gardening and in the best methods of growing the tomato and other standard vegetables.

4. To teach the best methods of canning what is not used fresh.

5. To provide a means by which boys and girls may earn some money and at the same time learn many valuable lessons.

There are many fruits and vegetables that may be grown profitably by school girls in their home gardens. Tomatoes and strawberries are probably the most profitable, as there is always a ready market for these, and the surplus is easily canned. In fact, the tomato is popular on account of the canning that goes with that club work, as most of the product is sold as canned goods. Many girls have

entered the acre corn contests. Sweet corn may be substituted for the field corn, if it is preferred by the girls, and part of the crop canned in the same manner as the tomatoes. In that case, a full acre would not be required unless three or four girls formed a partnership, and operated a home canning outfit together. This outfit is discussed elsewhere. Garden peas have been grown and canned successfully by some of the clubs.

Insects and weeds are deadly enemies of garden, field and orchard, and must be constantly guarded against. Poor seed also is often responsible for small yields. It is necessary, therefore, that girls, as well as boys, make a careful study of all garden pests and also learn how to test their seeds for purity and germination, if they are to get the best results. A poultry contest and a potato yield contest also could be conducted with advantage by girls.

Tomato growing, home canning and bread baking contests are discussed at length in this book. Many of the other subjects are discussed in a companion book, "Industrial Work for Boys." Consult bulletins and reference books for further information on organizing and conducting these contests and such other club work as may be undertaken.

TOMATO CONTEST

This has been one of the most popular and successful projects in club work and, where conditions are favorable for tomato raising, it is strongly recommended. A century ago the tomato was rarely grown and then only as an ornamental plant. It was thought to be poisonous until its food value was discovered accidentally. The tomato is now one of the most valuable vegetable crops in the United States, and is extensively grown in almost every other country. No other fruit or vegetable is so much used for canning purposes.

The young tomato plant is very tender and must not be transplanted until all danger of frost is past. In the northern states this time will be about the middle of May. The plants must, therefore, be started in window boxes or hotbeds, and transplanted to the garden. Start them about six weeks before they are to be set out in the open. There are a great many varieties of tomatoes, but the large, late kinds are best for canning. The plants should be set in rows at least four feet apart to allow plenty of room for horse cultivation and for the development of the plant. The distance apart in the row will depend upon the variety, as space enough for growth is necessary. Tomatoes thrive best in a rich, sandy soil and require plenty of warm weather during a long growing season. They must be kept free from weeds and insects and should not only be cultivated often, but kept hoed close to the plant. As soon as the young fruit is formed, the plant should be well supported by staking and tying or part of the crop will be spoiled on the damp ground. When time to ripen, cut away the surplus branches to let the sun in and allow the nourishment that would feed the branches to go to the green tomatoes. Early varieties may often be marketed fresh in small baskets at handsome profits, but the individual or girls' club should own a home canning outfit and can the main crop. Write to the national and state departments of agriculture for bulletins and information pertaining to the culture and canning of the tomato. Farmer's Bulletin No. 521 is good for the latter.

HOME CANNING

Canning has become very popular among both boys and girls during the last few years, both as home projects and as club work. As home work, it is usually done by the girls, but as club work, it is important for both girls and boys. Fruits,

vegetables and soups are canned and glass sealers and tin cans are used for containers. There is always a good demand for foods preserved in this way. The canning projects supplement the fruit and vegetable gardening work and make all profitable.

There are five general ways of canning food stuffs: the intermittent, or fractional-sterilization, method; cold-water method; vacuum-seal method; hot-pack, or open-kettle, method; and the cold-pack method.

The intermittent method is very effective, but requires three days to complete the process and is expensive in time and fuel. The cold-water method is used with sour food stuffs, such as gooseberries and rhubarb. The product is washed and sealed in cold water. In the vacuum-seal method a special can is required. It is successful, but has not yet come into general use.

The hot-pack, or open-kettle, method is still the common way of canning in most homes. The products are completely cooked before packing in the cans and sealing. The method is a success for fruits, but is a failure for vegetables, and it is always laborious.

The cold-pack method is gradually displacing the hot-pack. It is the method generally recommended for the club work and home canning projects. By it, vegetables, as well as fruits, may be preserved.

The equipment for canning by the cold-pack method need not be elaborate. While there are several kinds of commercial outfits on the market, their chief advantage over the homemade ones is their convenience. Homemade outfits may be constructed from washtubs, wash boilers, kettles, milk cans, pails, etc. Select an outfit that is deep enough for water to come one inch above the top of the tallest jar. This type of cooker is called a hot water bath outfit.

It should be provided with handles, a false bottom and a tight cover. The false bottom is used to keep the containers off the bottom and thus allow water to come in contact with the cans or jars. A tinner can make a special false bottom, or one can be made at home by fastening thin boards to some cleats and submerging in the water. Wire handles may be fastened to the false bottom to lift the entire lot of containers out when cooked, or the cans may be removed singly with tongs or other device.



Figure 56. Canning by the cold-pack method.

The various steps in cold-pack canning are, in order, as follows: Select sound products; grade for ripeness, size and quality; wash clean; trim, if necessary; scald or blanch to loosen the skin, reduce bulk and drive out objectionable acids; plunge into cold water immediately, or "cold dip," to separate the skin from the pulp, firm the texture, set the color and render packing easy; pack carefully and closely in glass jars or tin cans; add hot water for vegetables and hot water or hot syrup for fruits; place rubber and cover on jar

and partially seal, or cap and tip tin cans at once; cook, or "process," immediately and according to time-table, but do not begin to count time until the water in the cooker is boiling. Scalding is immersing for one or two minutes in boiling water or live steam. It is used mostly for tree fruits and tomatoes. Blanching is parboiling. The product is left in the boiling water for a longer period than is necessary for scalding. The time varies from one to fifteen minutes, according to the nature of the product.

The time necessary to cook the products will depend upon the kind of food stuff to be canned and the altitude. Water boils at 212°F. at sea level, but the boiling point decreases as the altitude increases. It takes longer, therefore, to cook the products at high altitudes. In general, the time should be increased at the rate of about 25 per cent for each increase of 4,000 feet in altitude. In general, the time required in the hot water bath outfit for soft fruits, such as berries, peaches, etc., at an altitude of 500 feet, is about 16 minutes; for sour berry fruits, such as currants, gooseberries, etc., about 16 minutes; for hard fruits, such as apples, pears, etc., 20 minutes; for greens, such as spinach, Swiss chard, etc., blanch 15 or 20 minutes and sterilize 90 minutes; for roots and tubers, such as parsnips, sweet potatoes, etc., 90 minutes; for tomatoes, 22 minutes; for sweet corn, 180 minutes; for string beans and peas, 120 minutes; and for pumpkin and squash, 60 minutes. While overcooking makes the product look mushy, it is always better to overcook than to undercook, as in the latter case the food is likely to spoil.

As soon as removed from the cooker, the glass containers should be tightly sealed, and placed bottom side up until cold. They should then be stored in a darkened place, as strong light fades the color.

The person or club doing the canning should send to the Department of Agriculture, Washington, D. C., for the N R series, "Co-operative Extension Work in Agriculture and Home Economics," for complete recipes, tables, etc., necessary for a thorough understanding of the subject. It is suggested that, where club work is done at school or at home, a commercial canning outfit should be purchased. It could belong to the club or to the school. Many clubs have worked on the co-operative plan and sold enough canned products from the home gardens to bring large returns for the time and money invested. Special labels for club work can be obtained and should be used for the cans that are to be sold. The club brand is popular in many markets.

BREAD BAKING CONTEST

Bread is truly the "staff of life" in the American home, and bread making is one of the things that every girl should learn to do well. Experience is a good teacher, but experience alone will not produce good bread and biscuit bakers, as many fathers and brothers can testify. The scientific principles must be understood. No experiment should be more interesting than that of learning to bake bread. If possible, demonstrations should be given at school before the home credit work begins. In any event every girl should seek an opportunity to show what she can do in baking for a certain length of time either in school or at home or both. One state held a bread baking contest with over eighty counties represented and more than sixteen hundred contestants.

The essential factors in bread making are the flour, the yeast and the liquid used. It is true that there is a difference in flour, but most of the flour made in modern mills is good flour and should make good bread. Some flours require more

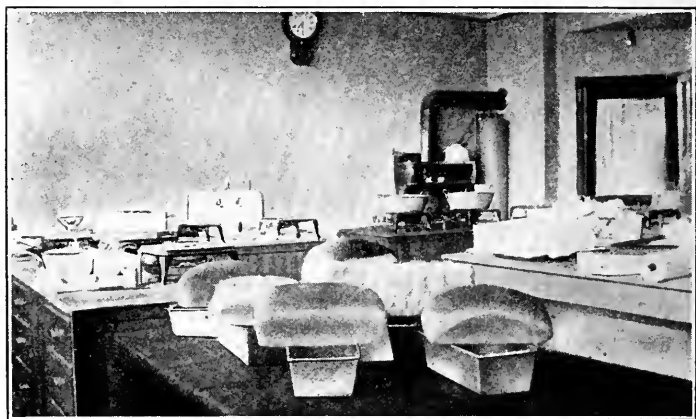


Figure 57. Prize winning loaves in a state bread baking contest. Over sixteen hundred entries were in competition.

liquid, or more kneading, or something else different from others, but it is usually not the fault of the flour when the bread is not good. Good bread makers can generally use the home flour with success. Wheat flour contains stronger gluten than any other and it is this that makes the bread light. For this reason white flour is mixed with rye and other flours to make them light. Yeast is one of the dust plants found in the air. Because it gives off carbon dioxide which causes the bread to rise as the gas expands, it is used commercially in various forms. The yeast cake, dried or compressed, is probably best for general use, although the homemade yeast sometimes gives better results.

Compressed yeast is used in the short process of bread making and has certain advantages over other yeasts. It is very active, but must be used while it is fresh as it will not keep long. Dark spots indicate dead yeast plants; hence, whenever compressed yeast is used, it should be carefully inspected. The chief disadvantage in the use of compressed

yeast is that it is almost impossible for those who cannot get it fresh frequently to keep it active. The other kinds are better for ordinary use. On the other hand, if it is not possible or convenient to keep a sponge over night, the compressed yeast will hurry up the process so that the bread can be baked the same day the sponge is set.

Milk, water, potato water and buttermilk are all used as liquids. Milk usually gives a better crust than the others and the bread will keep fresh longer. Equal quantities of milk and water are often used, but buttermilk is not so commonly a factor in bread making. Other ingredients are sugar, which acts as food for the yeast plant and hastens the rising, salt for flavoring, and shortening to make the bread tender.

There are several methods of scoring bread when it is judged in contests. The following is one that is used in judging the bread in the contest work of one state: General appearance, twenty points; flavoring, odor and taste, thirty-five points; lightness, fifteen points; and crumb texture, color, grain, thirty points; total, one hundred points.

See Chapter IV for recipe for yeast bread. If you enter any particular contest, you will probably have a definite recipe to follow. When you write your booklet on "Bread Baking," tell which recipe you used.

CHAPTER VII

HOME CREDIT EXERCISES

Many city and village schools have adopted the advanced policy of allowing school credit for certain kinds of home work. There is no good reason why this plan cannot be extended to the rural schools as well. The following "Home Credit Exercises" have been carefully planned with a view to giving such credit. In any event, they are worth doing and the teacher can be of great assistance in directing the work whether the school can give credit or not.

THE FLOWER GARDEN

There should be more flower gardens on our home grounds. After studying references on landscape gardening and consulting with teacher, brothers and parents, plan a landscape garden for the front of the house. If not already in grass, the soil should be leveled and seeded down or sodded. When ready to plant, use a plat drawn especially for this purpose and set out the shrubs first. As shrubs are permanent, great care must be used in the arrangement. A small lawn will be crowded if more than a few are used. A few clusters, with two or more shrubs in a cluster, placed in an irregular manner, as nature arranges them, will be sufficient. The rose, snowball, bridal wreath and syringa are some of the beautiful flowering shrubs. One or more flower beds, depending upon the size of the lawn, should be provided. They may be round, oval or irregular, as desired, and they should be elevated. Cannas are beautiful for the center. Small geraniums, carnations, begonias, sweet alyssum or some other favorite plants that are suitable, should surround the cannas. Have some small foliage plants around all as a

border for the bed. Be careful to use good judgment in the arrangement so that the colors will blend harmoniously as well as produce a natural effect in the landscape.

A delightful back garden may be produced in the back yard with a little planning and work. If you can have a summer playhouse, which should be the inheritance of every young person, so much the better. Cover it with five-leaf ivy and climbing roses, and make it the center of attraction. Winding paths, bordered by hedges and shaded with flowering shrubs, should lead to the house. Old-fashioned flowers may be arranged artistically as space will permit. For a permanent border, select columbines, foxgloves, larkspurs, Canterbury bells, bleeding heart and other old favorites. For annual beds, there are many kinds that are suitable, such as sweet peas, pansies, phlox, asters, violets, poppies, nasturtiums, gladioli and chrysanthemums.

Such a flower garden as here suggested will require plenty of energy and constant care, but it may be made a veritable fairyland of birds and bees and flowers, and is well worth while. It should be made a home club affair in which all the members of the family take an interest. Neither the cost nor the labor can be the reasons why there are so few such gardens. Some one must take the initiative and show that the project is commendable. The girls can do it. Let the school help you get yours started.

HOUSE PLANTS

In case it seems impossible to carry out the flower garden idea on such an elaborate scale as given under that heading, there is still opportunity to work with flowers in the home. Many of these can be transplanted to the garden during the summer. A few flower pots or window boxes will be all

that is necessary at first. If there is a large south or east window in the house, so much the better. A flower stand can be made of narrow boards, and stained or painted to harmonize with the surroundings. Select the varieties you like best and secure slips and bulbs from your neighbors or the florist. Plant in rich, mellow soil and keep well watered. Loosen the soil occasionally to prevent baking or hardening. Watch for plant lice and destroy them with a soap emulsion sprayed over the plant. A few common house plants are the geranium, hydrangea, lily, fuchsia, carnation, begonia, petunia, Christmas cactus, asparagus and sword ferns. Both pleasure and profit will be derived from a careful study of house plants.

BIRD STUDY

One of the most interesting projects for which home credit should be given is a study of the common birds. This, being outdoor work, will afford abundance of healthful exercise. A notebook should be a constant companion and, if you are fortunate enough to have a kodak, the field work will be still more interesting. Your notes should be written in permanent form into a "Birds That I Know" booklet.

Birds are classified as land, water, game and birds of prey. Some go south for the winter; others do not. You should make a table of these migrations with dates in the spring and fall. Some birds are injurious, destroying grains, fruits, beneficial animals and other birds. Some of these are the common English sparrow, the kingfisher and the crow. These birds should be destroyed. Other birds are highly beneficial and should be protected. Still others are prized for their songs and plumage. Some of the beneficial birds are as follows: Robin, house wren, song sparrow, orchard

oriole, bank swallow, barn swallow, blue jay, cardinal, red-winged blackbird, redheaded woodpecker, killdeer, quail, dove, screech owl, barn owl, buzzard, humming bird, cowbird and meadow lark. Nearly all these, as well as many others, can be observed and studied in your community. Birds feed chiefly upon insects and other injurious pests and hence should be protected. State and national laws protect most of these birds, but you can help also. Bird houses to protect from cold and wet, crumbs thrown out when snow is on the ground and watching that cats and other animals do not molest the young birds just from the nest are some of the ways.

BED MAKING

Every girl should learn how to make beds properly and then apply her knowledge. This is a very good task for home credit work.

On rising in the morning, throw the bed covers back over the foot of the bed allowing the bedding to air for an hour or two with the windows open. Then make the beds as follows: Straighten the mattress and smooth out the pad carefully, before putting on the sheets. Spread the lower sheet right side up over the bed. Bring the edges and ends well under the mattress in order that it may be protected and that the sheet will not become unnecessarily wrinkled. Spread the upper sheet over the bed wrong side up and the wide hem or ornamented end of the sheet toward the head of the bed. Bring the sheet up far enough so that it can be turned back about eight or ten inches over the blankets or quilts in order to protect them. Be sure to place all covers on the bed so that they extend equally on both sides. Tuck the covers down at the foot of the bed. Put on the spread neatly. Fluff out the pillows and arrange them neatly at the head of the bed.

At least once a week air the bedclothes out-of-doors in the sunshine. Fresh air and sunshine are the best purifiers and germ killers known. Turn the mattress over and exchange ends occasionally to prevent forming hollows in it. Sheets and pillow cases should be changed at least once a week.

PREPARING A MEAL

Get the breakfast or some other meal regularly for six weeks or other convenient unit of time. Such work is excellent training and the parents can determine how soon the students should be allowed credit in school for the work done at home. A signed statement from them may be taken to the teacher. The following suggestions for preparing a meal may be helpful:

Prepare those things in advance which can be so prepared without injuring the quality of food, in case it is some time before they are to be served. Start those dishes first which take the longest time; then those that are to be prepared and served at once. Watch the clock and try to have things ready just in time. For the beginner, it is advisable to choose dishes that will not spoil if completed a short time before they are to be served. Serve those dishes which are to be hot, hot; and cold dishes, cold. Wash as many of the mixing and cooking utensils as possible before serving the meal. You will find it necessary to remain in the kitchen during the greater part of the time while the meal is cooking. Make use of the spare moments and there will be fewer dishes to wash later.

LAYING THE TABLE

Learn how to lay a table properly and then arrange to have charge of it for six weeks at a time, or as long as it may be desired. Since many persons do not lay the

table properly, be sure that you know how before you begin to do this work. The following suggestions may be helpful:

Spread a white felt cloth over the table to protect its polish, to give body to the tablecloth and to deaden the sound. When buying the silence cloth, as the felt cloth is called, plan to have it extend well over the edges of the table and make it long enough to allow for shrinkage. Spread the tablecloth over this, having the lengthwise fold extending the long way of the table, and the cloth extending over equally at both ends and at the sides. Make similar plans for a round table. Place the centerpiece in the center of the table and on it a rather shallow dish of flowers. A table fern or other suitable plant may be used. At breakfast, it is pleasing to have a dish of fruit in the center of the table.

Allow about two feet for each cover. A "cover" means the knives, forks, spoons, plates, tumbler and napkin needed by each person. Excepting the tumbler, the cover is placed from one half to one inch from the edge of the table. The plate is placed in the middle of the cover, the forks at the left of the plate in the order in which they are to be used, beginning at the outside. The napkin is placed at the left of the forks. The knives and spoons are at the right of the plate, also in the order in which they are to be used, beginning at the outside. The sharp edge of the knives should be towards the plate. The bowls of the spoons and the tines of the forks should be up. The tumbler is placed at the end of the knives and slightly towards the plate.

Salt and pepper, cream and sugar, jelly and pickles, and usually bread and butter are placed on the table before the meal is announced.

SERVING MEALS

To serve a meal properly is an art every girl should be proud to accomplish. Do this one or more meals daily for six weeks or longer and submit a report to school for home credit.

Have everything that is to accompany the first course on the table when the meal is announced. When a waitress is serving something in an individual dish it should be placed from the right-hand side of the person sitting at the table. When the waitress is passing a dish from which the person being served is to help himself, it should be passed to the left of the person, and the dish should be held on the level of the table. As soon as the course is completed, remove it and everything that was served with it. Next remove the soiled dishes and the silver used for the course. Remove all dishes from the right of the person. In polite society it is considered best to remove the dishes from but one cover at a time. In any event, do not take more than from two persons at one time. The waitress should be careful while serving not to reach in front of anyone.

Before serving the dessert, remove the crumbs from the table, using a crumb tray. Have the glasses of water filled only three fourths full when the guests are seated. The glasses should be refilled if necessary during the meal, being careful to take hold of the glass as near the bottom as possible. Remove but one tumbler at a time when refilling it, as otherwise the glasses might be exchanged.

CLEARING DINING TABLE AND WASHING DISHES

First remove all soiled dishes from the dining table. If necessary, scrape crumbs from the table again. Remove the cloth, folding it carefully in the same folds. Remove the silence cloth. If the napkins have been used by the regular members of the family, they may be used again and should

be placed in the sideboard drawer; but, if used for special guests for that particular meal, they should be taken directly to the laundry.

Place a centerpiece on the table, and on it a dish of flowers or ferns, if available. Brush up the crumbs from the floor.

While the dining room is being cleared, the water should be heating for the dishes. Collect the silver and place it to soak in a jar or pitcher. Remove all particles of food from the dishes, using a plate scraper or a crust of bread. Wipe greasy dishes with a paper. Soak those which contained sugar mixtures in warm water, and those that contained milk, eggs and starchy mixtures in cold water, before starting to wash the dishes. Pile the plates of one size together. If but few of a kind, the smaller ones may be placed on top. Remove left over food to smaller dishes and put it away in the refrigerator or other sanitary place. Prepare warm, soapy water in the dish pan and in it wash the glassware. Some prefer to dry the glassware without rinsing it, as it is then more easily polished. Use a clean dry towel. Put each lot of dishes away as soon as dried. Wash, rinse and dry in the following order: Silver, cups, saucers, small odd dishes, as cream pitchers, etc., small plates, large plates, serving dishes, mixing and cooking utensils. Change the water if there are many dishes, as the work cannot be well done otherwise, and the dish towels become unnecessarily soiled. Clean the work tables. When the dishwater is emptied, wash, rinse and dry with the towel the dish pan and the drain pan. Wash and rinse the dish cloth and hang it up where it can dry quickly and be aired. Also hang up the dish towels to dry. Clean the sink thoroughly, using a special cloth for that purpose.

FLY CONTROL

One of the worst pests of modern life is the common house, or "typhoid," fly. It is filthy and loathsome, breeding in barnyard manure, outhouses, etc.; consequently, it is one of the worst disease carriers. Typhoid fever, tuberculosis and dysentery are often traced to the house fly. The only real preventive is to get rid of the breeding places. Manure must not be allowed to collect. Houses should be made modern; but, until then, outhouses can be screened and kept clean and odorless. Do not throw out dishwater or other slops where they will be a harbor for flies. Have a

garbage pail and use it. See that all doors and windows are screened. Fly poisons are dangerous and must be used with care. The commercial sticky papers and the "swatter" help get rid of those flies already in the house. A few cedar boughs suspended from

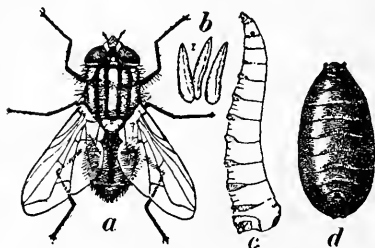


Figure 58. House, or typhoid, fly—a, adult or fly; b, eggs; c, larva or maggot; d, pupa; all enlarged.

the ceiling will attract the flies to roost at night, from which they may be shaken into bags. Send to your state entomologist for a bulletin on the control of flies, and a description of traps for catching them. Many communities have annual crusades against flies, offering bounties and rewards for the largest numbers. This is a home project worthy of study.

PLANNING THE HOME

Make drawings of your home showing the rooms on each floor as well as the basement. Make three drawings—the

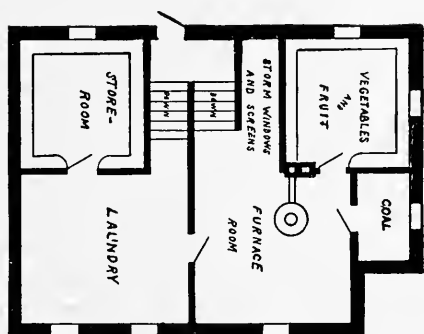


Figure 59. Basement plan.

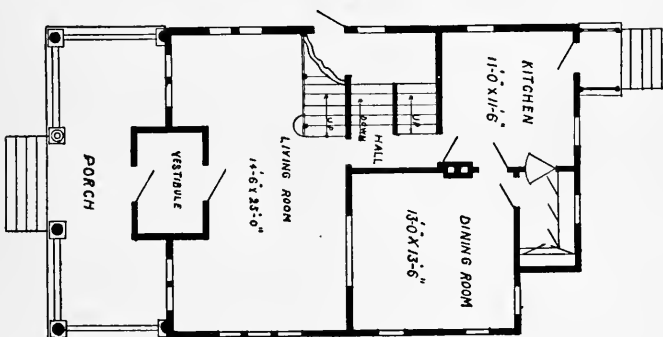


Figure 60. First floor plan.

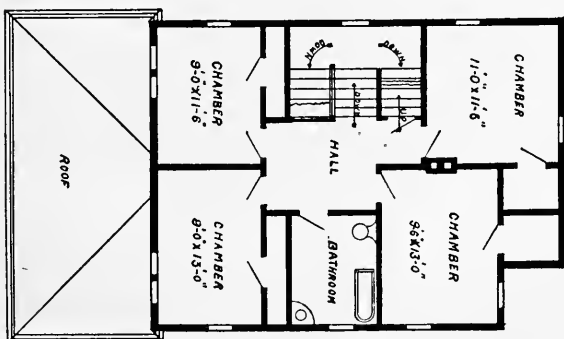


Figure 61. Second floor plan.

House floor plans suggestive of drawings required in exercises on planning the home.

basement, first floor and second floor. Be careful to show the details, as location of the clothes closets, direction in which the doors swing, etc., as these are very important. After these drawings have been approved by the teacher, draw an original house plan, laying out each room exactly as you want it, keeping convenience, comfort, sanitation, art and cost in mind. Draw this to some convenient scale, as one half inch to the foot. This exercise is valuable and will require some careful reading, study and consultation.

VENTILATION

If there is a new barn at your home, it probably has special ventilators to carry off the foul air and furnish the stock with plenty of pure air. Where are the ventilators in the house? Very likely the stove, the doors and the windows are the only means of getting a change of air. This method of ventilating is not so bad in summer, if the doors and win-

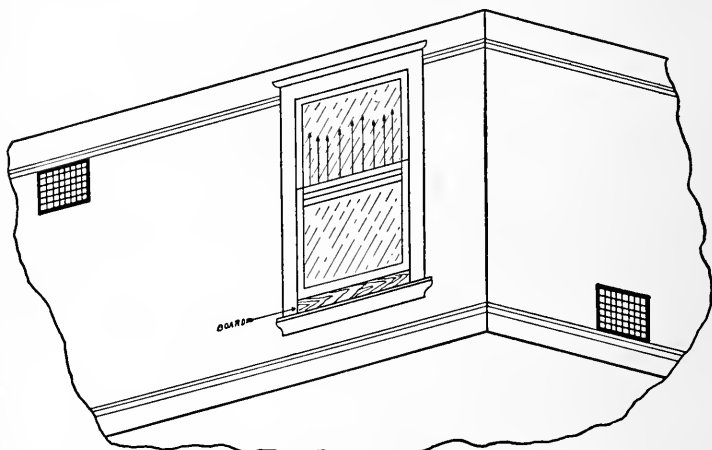


Figure 62. Ventilation of room, showing "window" and "register" methods. A board inserted at the bottom of the window will leave space between the two sashes for the admission of air. The register method is possible only with a furnace.

dows are kept open, but in cold weather it is seldom that the home is well ventilated. Air becomes impure and a source of disease. Colds, tuberculosis and many other diseases are often caused from impure air, through lack of ventilation. A simple test for carbon dioxide in the air is limewater. Slack a small lump of lime in cold water and let it settle. Pour off the clear limewater, put a few spoonfuls into a glass jar and allow it to stand for several hours in the room you wish to test. If a white powdery looking substance settles in the bottom after you shake the jar there is enough carbon dioxide in the air to be injurious and the air is not fit to breathe. Test the air of the schoolroom, and then of the bedrooms at home. What are your conclusions? Do you always sleep with your windows up, winter as well as summer? If not, try it.

SAVINGS BANKS

One of the best plans to encourage thrift and teach the value of saving is the one now adopted by many schools of affiliating the school with one or more banks and allowing students to make weekly deposits. The teacher acts as local cashier and deposits the money at the banks when convenient. One day a week is known as banking day at school and pupils may deposit any amount from one cent up. They are given stamps as certificates. These stamps are furnished free by the banks. One school of thirty students recently deposited more than \$100 in four months, most of which would have been spent needlessly, had they not become interested in the savings bank movement. The garden and club work make it possible for all young persons to earn money for themselves, and there is all the more need of learning to save. Many look upon "pin" money as something with which to buy chewing gum and candy, if not

something more injurious. Increasing the earning capacity is very important; but unless one learns to spend less than is earned, there can be no saving. The following ten thrift maxims have been selected from an Oregon pamphlet on "Industrial Club Work." They are proverbs well worth considering:

"Fortune helps them that help themselves."

"Punctuality is the soul of business."

"Who will not keep a penny shall never have many."

"Plow deep while sluggards sleep, and you shall have corn to sell and keep."

"Industry is fortune's right hand and frugality her left."

"He is poor whose expenses exceed his income."

"Early to bed, early to rise, makes a man healthy, wealthy and wise."

"He that will not stoop for a pin will never be worth a pound."

"He that has but four, and spends five, has no need of a purse."

"He that saves when he is young, may spend when he is old."

HOME ACCOUNTS

Every girl should know how to keep simple home accounts, and then keep them. It is said that the average housekeeper has the spending of about three fourths of the income for the family. She should spend it systematically and economically, and keeping accounts will assist her to do so. As a supplement to the club work and savings bank accounts this work is admirable.

Learning to keep accounts should be a part of the arithmetic work of the upper classes. There are a few simple things that must be remembered and always followed.

An account may be defined as the name under which certain transactions are arranged according to whether they have been "received," or "parted with." When an account receives something, the transaction is put on the left side, or "debited"; when it parts with something, the transaction is put on the right side, or "credited." The school should have some special ledger cards, about six by eight inches, made up for this work.

The inventory is the first step in starting accounts. A continued form is shown. Study it and make out one for your home. A half dozen accounts is all that is necessary, unless you run store accounts. In that event, you will need a personal account for each firm with which you trade. Study the suggestive accounts here given and start to keep the real records of your home as a home credit project.

Suggestive Accounts

CONTINUED INVENTORIES

| Items | Remarks | Jan. 1, 1915 | Jan. 1, 1916 | Jan. 1, 1917 |
|-------------------|----------------------|-----------------|-----------------|-----------------|
| Kitchen Utensils | | | | |
| 1 Range..... | 3 yrs. old..... | 40 00 | 36 00 | |
| 1 Tea Kettle..... | Nickel..... | 1 50 | 1 00 | |
| 2 Dish Pans..... | Enamel..... | 1 50 | 1 00 | |
| Etc..... | | | | |
| Dining Room | | | | |
| 1 Table..... | Quar. Oak..... | 22 50 | 20 00 | |
| 6 Chairs..... | Quar. Oak..... | 9 00 | 7 00 | |
| Table Linen..... | Cloths, Napkins..... | 12 50 | 8 50 | |
| Etc..... | | | | |
| Living Room | | | | |
| 2 Rockers..... | Oak..... | 15 00 | 12 00 | |
| 1 Stand..... | Oak..... | 3 75 | 3 25 | |
| 1 Rug..... | Wilton..... | 18 00 | 16 00 | |
| Etc..... | | | | |
| Hall | | | | |
| 1 Hall Tree..... | Oak..... | 4 50 | 4 25 | |
| 1 Rug..... | Brussels..... | 8 50 | 7 00 | |
| Bedrooms | | | | |
| 2 Bedsteads..... | Iron..... | 17 50 | 16 50 | |
| 2 Rugs..... | Rag..... | 6 00 | 4 00 | |
| 2 Dressers..... | Oak..... | 18 00 | 16 00 | |

S. A. NORBERG

| Date | Brought Forward | | Date | Brought Forward | |
|------|---------------------|------|------|---------------------------|------|
| 3-16 | Received Check..... | 2 60 | 1-5 | 1 Sack Flour..... | 2 10 |
| | | | 1-9 | 2 lbs. Dairy Butter @ 25c | 2 60 |
| | | 2 60 | | | 2 60 |

C. A. SWANSON

| Date | Brought Forward | | Date | Brought Forward | |
|------|---------------------|------|------|--------------------------|------|
| 1-16 | Received Check..... | 3 30 | 1-4 | 2 Kitchen Chairs @ 75c.. | 1 50 |
| | | | 1-6 | Picture Wire..... | 10 |
| | | | | 2 yds. Linoleum @ 85c... | 1 70 |
| | | 3 30 | | | 3 30 |

A. L. THELANDER & CO.

| Date | Brought Forward | | Date | Brought Forward | |
|------|-----------------|------|------|--------------------------|------|
| 1-16 | By Check..... | 4 85 | 1-11 | 5 gal. Kerosene @ 15c... | 75 |
| | | | 1-14 | 2 pkgs. Needles @ 10c... | 20 |
| | | | | 1 pr. Shoes..... | 3 50 |
| | | | 1-16 | 1 pr. Yarn Gloves..... | 50 |
| | | | | 6 yds. Gingham @ 15c... | 90 |
| | | 4 85 | | | 4 85 |

MRS. HENRY SMITH

| Date | Brought Forward | | Date | Brought Forward | |
|------|--------------------------|-------|------|---------------------|-------|
| 1-16 | Monthly Allowance | 40 00 | 1-2 | Received Check..... | 40 00 |
| | | 40 00 | | | 40 00 |

CASH

| Date | Brought Forward | | Date | Brought Forward | |
|------|---------------------|-------|------|---------------------------|-------|
| 1-2 | Received Check..... | 40 00 | 1-2 | 2 lbs. Mutton @ 15c..... | 30 |
| | | | | 1 lb. Lard..... | 18 |
| | | | | Paid Rent..... | 10 00 |
| | | | 1-10 | Church Collections..... | 50 |
| | | | 1-16 | A. L. Thelander & Co..... | 4 85 |
| | | | | S. A. Norberg..... | 2 60 |
| | | | | C. A. Swanson..... | 3 30 |
| | | | 1-16 | Bal. on Hand | 18 27 |
| | | 40 00 | | | 40 00 |
| 1-16 | Bal. on Hand | 18 27 | | | |

RENT, FUEL & LIGHTING

| Date | Brought Forward | | Date | Brought Forward | |
|------|-------------------------|-------|------|-----------------|-------|
| 1-2 | Paid Rent..... | 10 00 | 3-16 | Expense..... | 10 75 |
| 1-11 | 5 gal. Kerosene @ 15c.. | 75 | | | |
| | | 10 75 | | | 10 75 |

HOUSE FURNISHINGS

| Date | Brought Forward | | Date | Brought Forward | |
|------|----------------------------|------|------|------------------------|------|
| 1-4 | 2 Kitchen Chairs @ 75c ... | 1 50 | 3-16 | House F. Expense | 3 30 |
| 1-6 | Picture Wire..... | 10 | | | |
| | 2 yds. Linoleum @ 85c.... | 1 70 | | | |
| | | 3 30 | | | 3 30 |

CLOTHING

| Date | Brought Forward | | Date | Brought Forward | |
|------|--------------------------|------|------|------------------------|------|
| 1-14 | 1 pr. Shoes..... | 3 50 | 3-16 | Clothing Expense | 4 90 |
| 1-16 | 1 pr. Yarn Gloves..... | 50 | | | |
| | 6 yds. Gingham @ 15c.... | 90 | | | |
| | | 4 90 | | | 4 90 |

FOOD SUPPLIES

| Date | Brought Forward | | Date | Brought Forward | |
|------|--------------------------|------|------|-------------------|------|
| 1-2 | 2 lbs. Mutton @ 15c..... | 30 | 1-16 | Food Expense..... | 3 08 |
| | 1 lb. Lard..... | 18 | | | |
| 1-5 | 1 Sack Flour..... | 2 10 | | | |
| 1-9 | 2 lbs. Butter @ 25c..... | 50 | | | |
| | | 3 08 | | | 3 08 |

MISCELLANEOUS

| Date | Brought Forward | | Date | Brought Forward | |
|------|---------------------------|----|------|--------------------|----|
| 1-10 | Church Collection..... | 50 | 3-16 | Misc. Expense..... | 70 |
| 1-14 | 2 pkgs. Needles @ 10c.... | 20 | | | |
| | | 70 | | | 70 |

OTHER HOME PROJECTS

There are many other suitable exercises for which the school should give home credit under certain conditions, but space will not permit discussions. Some of them are as

follows: Dusting with oiled cloths, scrubbing floors, washing clothes, ironing, pressing clothes, planning menus, purchasing materials, learning the cuts of meats and their values, preserving fresh eggs, making dairy butter, and a study of textiles—wool, cotton, linen, silk, etc.

INDUSTRIAL EXHIBIT

Finally, as the grand climax of the industrial work, plan to have at least one industrial exhibit each year at the school and invite all the people of the community. Get the farmers' club, the creamery directors and other organizations, as well as the school board, interested enough to offer small prizes to encourage the work. If no prizes are offered, have the exhibit anyway. The best plan is to have two—one in the spring, just before school is out, and the other in fall just before cold weather. In the spring the best work of the year at school may be shown, not only the industrial work, but arithmetic, writing, language, etc. A spelling contest will add interest. In the fall, a "harvest home festival" may be given at which will be exhibited the work done by the students during the summer. This will include garden products, corn, tomato, canning and other contest work, as well as any other special "home credit" projects.

The following premium list was used for the annual contest of fifteen rural associated schools at Cokato, Minnesota, spring of 1915. In addition to the individual and school prizes, a sweepstakes silver trophy was offered, which becomes the permanent property of any school winning it for two successive years.

Premium List for Contest in Associated Schools

PENMANSHIP

- | | | | |
|--|-----|-----|-----|
| 1. Best individual specimen of writing, including movement exercises, small letters, capitals, figures and words . . . | .75 | .50 | .25 |
| 2. Best general display from all grades | .75 | .50 | .25 |

GEOGRAPHY

| | | | |
|--|-----|-----|-----|
| 1. Best relief map of Minnesota..... | .75 | .50 | .25 |
| 2. Best relief map of any continent..... | .75 | .50 | .25 |
| 3. Best drawn map of any kind..... | .75 | .50 | .25 |

LANGUAGE

| | | | |
|--|-----|-----|-----|
| 1. Best booklet on any one of the following topics: Corn, Noxious Weeds, Vegetable Garden, Strawberries, Ap- ples, Poultry for Pleasure and Profit, Farm Animals, Bee Culture, Home Sanitation, The Typhoid Fly.... | .75 | .50 | .25 |
| 2. Best general display from all grades..... | .75 | .50 | .25 |

ARITHMETIC

| | | | |
|--|-----|-----|-----|
| 1. Best general display from all grades..... | .75 | .50 | .25 |
|--|-----|-----|-----|

ELEMENTARY INDUSTRIAL WORK

| | | | |
|---|-----|-----|-----|
| 1. Best woven mat, yarn or cloth..... | .75 | .50 | .25 |
| 2. Best hammock..... | .75 | .50 | .25 |
| 3. Best napkin ring..... | .75 | .50 | .25 |
| 4. Best raffia or reed mat..... | .75 | .50 | .25 |
| 5. Best raffia or reed basket..... | .75 | .50 | .25 |
| 6. Best yarn cap or bonnet..... | .75 | .50 | .25 |
| 7. Best clay exhibit..... | .75 | .50 | .25 |
| 8. Best general exhibit of industrial work..... | .75 | .50 | .25 |

SEWING

| | | | |
|---|-----|-----|------|
| 1. Best needlebook..... | .50 | .35 | .25 |
| 2. Best outing flannel holder..... | .50 | .35 | .25 |
| 3. Best gingham holder..... | .50 | .35 | .25 |
| 4. Best sleevelets..... | .50 | .35 | .25 |
| 5. Best cap..... | .50 | .35 | .25 |
| 6. Best hemstitched towel..... | .75 | .50 | .25 |
| 7. Best stockinet darning..... | .75 | .50 | .25 |
| 8. Best buttonholes..... | .75 | .50 | .25 |
| 9. Best gingham bag..... | .75 | .50 | .25 |
| 10. Best sewing apron..... | .75 | .50 | .25 |
| 11. Best hemmed patch..... | .75 | .50 | .25 |
| 12. Best three-cornered darn..... | .75 | .50 | .25 |
| 13. Best outing flannel nightgown..... | .75 | .50 | .25 |
| 14. Best overhand patch..... | .75 | .50 | .25 |
| 15. Best general exhibit of sewing..... | | | 1.00 |
| Each article is to be made as directed in course of study | | | |

MANUAL TRAINING

| | | | |
|--|-----|-----|------|
| 1. Best match scratcher..... | .50 | .35 | .25 |
| 2. Best plant marker..... | .50 | .35 | .25 |
| 3. Best salt box..... | .75 | .50 | .25 |
| 4. Best match box..... | .75 | .50 | .25 |
| 5. Best other article..... | .75 | .50 | .25 |
| 6. Best composition on "Manual Training in the Rural School"..... | .75 | .50 | .25 |
| 7. Best general exhibit in manual training..... | | | 1.00 |

AGRICULTURE

| | | | |
|--|-----|-----|------|
| 1. Corn judging contest..... | .75 | .50 | .25 |
| 2. Corn germinator with germinating corn ready to count. Must include report on test and opinion of seed by ex- hibitor..... | .75 | .50 | .25 |
| 3. Long and short splice (both must be included)..... | .75 | .50 | .25 |
| 4. Best general exhibit of rope work including knots and splices..... | .75 | .50 | .25 |
| 5. Best noxious weed seed exhibit to be selected and de- termined by the school..... | .75 | .50 | .25 |
| 6. Best general exhibit in agricultural work..... | | | 1.00 |

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